

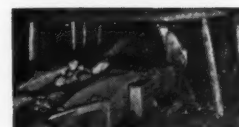
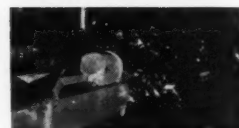
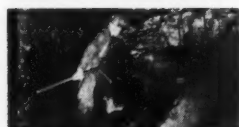
MINING

CONGRESS JOURNAL

★
AUGUST
1944
★

A
JOURNAL
for the
ENTIRE
MINING
INDUSTRY
Published
by the
AMERICAN
MINING
CONGRESS





Make every drill hole count

There is little need to remind experienced coal men about the importance of drilling — but, no matter how carefully you plan your blasts, every drill hole will not produce the desired result unless you

Fit the explosive to your seam

This simply means selection of the right explosive — to suit the conditions in your seam — to get the type of breakdown you desire.

In AMERICAN permissibles, products of intensive research, chemical control, thorough inspection and unremitting care in manufacture there is a grade fitted to your requirements.

• *Capable field engineers are available at your call.*

★ **HIGH EXPLOSIVES**

★ **PERMISSIBLES**

★ **BLASTING
POWDER**

★ **BLASTING
ACCESSORIES**

American Cyanamid & Chemical Corporation



A Unit of American Cyanamid Company

**30 ROCKEFELLER PLAZA • NEW YORK, N. Y.
EXPLOSIVES DEPARTMENT**

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MINING

CONGRESS JOURNAL

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Fuel and hydro electric power consumption in the United States during 1943 was 230,300,000 B.t.u. per person—and there are 134,000,000 of us!

After deducting 60,000,000 B.t.u. for space heating, the remainder indicates a continuous supply of 12.5 hp. for every one of 60,000,000 workers during 300 work-days of 8 hours each. Truly, we have reached an age of "power."

54.7 percent of this enormous supply of energy comes from COAL.



FRONT COVER: Black Bear property looking toward Telluride, San Juan County, Colorado.
Courtesy Colorado Mining Association

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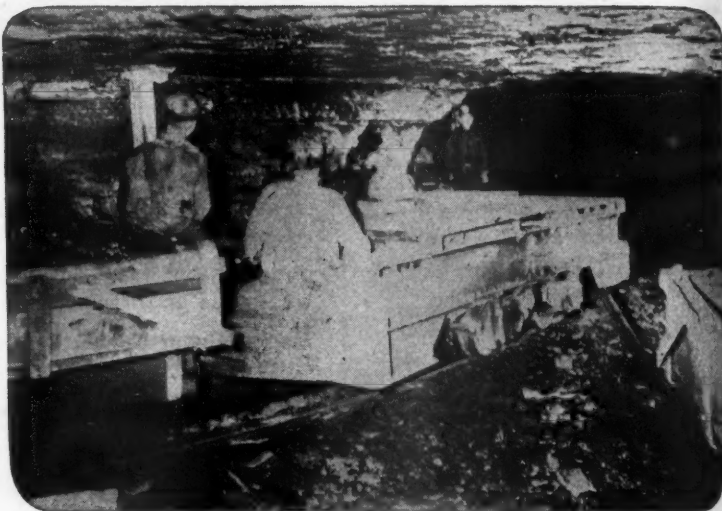
309 MUNSEY BLDG., WASHINGTON 4, D. C.

HOWARD I. YOUNG, *President* DONALD A. CALLAHAN, *Vice President*
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JULIAN D. CONOVER, *Secretary*



How Alkaline Batteries Cut Haulage Costs

Alkaline batteries average a life of 10 to 12 years in the mine where the photograph of this gathering motor was taken. ➡



MOTOR FALLS 75 FEET DOWN WASTE DUMP; BATTERY DAMAGE: ONE CELL CONTAINER AND ONE PLATE GROUP

Although the rule is to keep the motor back of the cars when dumping waste, some green help reversed the order and took out a train with the motor ahead. Then the motorman moved the controller in the wrong direction.

The motor jumped the stop chain, went 75 feet down the dump, throwing out its alkaline battery which came to rest on one side. The battery was sent to our service station to determine whether or not it was still serviceable. Result: one cell container and one plate group were found to be damaged and were replaced. The cells were then tested; all delivered full rated capacity.

The steel cell construction of alkaline batteries which is the reason they survive accidents with so little damage, is also an important reason for the extra dependability they deliver under more normal conditions.

Use of Edison Alkaline Batteries in battery-operated locomotives and shuttle cars will help cut your haulage costs in several ways.

Perhaps most important, their unequaled dependability gives the closest approach to failure-free uninterrupted haulage it is possible to obtain. This is due partly to their steel cell construction which withstands rough usage, partly to their alkaline electrolyte which is a preservative of steel, and partly to their electrochemical principle of operation which is free from self-destructive reactions.

They do not require critical adjustment of charge rates, hence can be charged direct from the d-c power supply through relatively inexpensive resistors without need of motor-generator. They can be fully recharged in 6 to 7 hours and require no equalizing which helps get all charging done during off-peak periods.

Finally, they give much longer service life than any other type of battery. *Edison Storage Battery Division of Thomas A. Edison, Inc., West Orange, New Jersey.*

Edison
ALKALINE BATTERIES

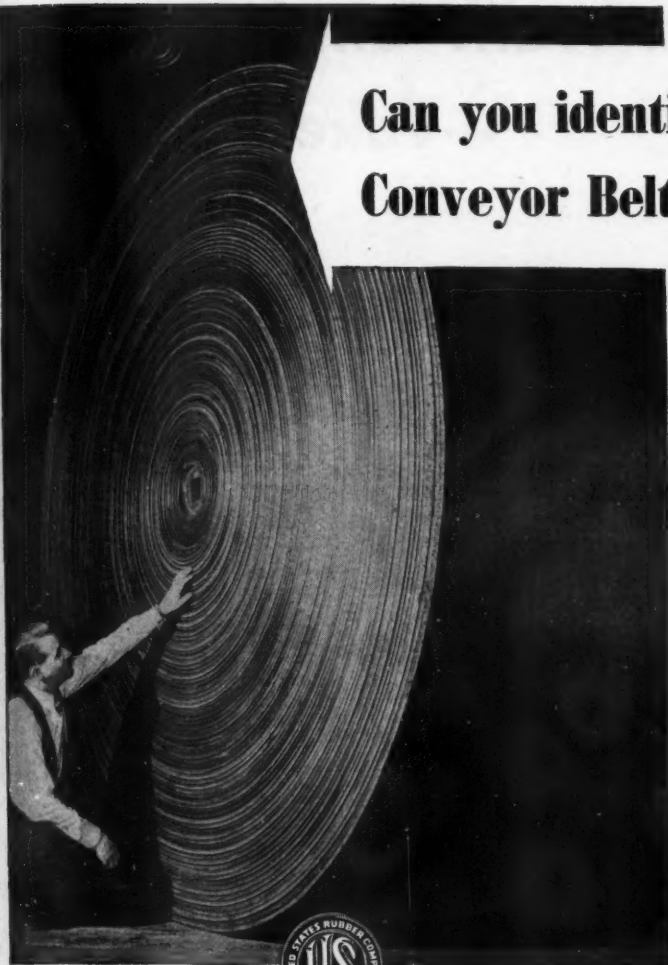
Can you identify a Synthetic Rubber Conveyor Belt by looking at it?

No, to the eye, a synthetic rubber conveyor belt looks exactly like one made of natural rubber. Nor can you judge by its looks how much compounding skill has gone into it, how carefully it has been fabricated, to what rigid tests and inspections it has been put.

These are the things that determine the tonnage a belt will convey during its life, the trouble-free service it will deliver, the savings it will effect in operation.

The one safe guide is the maker's name. U.S. Rubber Conveyor Belts have long enjoyed the highest reputation. The "U.S." Belts of synthetic rubber are upholding that reputation. Each is individually designed...each engineered from the scene of action for a particular installation.

"U.S." Synthetic Rubber Belts are the result of unrelenting research, of accumulated technical knowledge, of skillful craftsmanship applied through modern, scientific laboratory and manufacturing facilities.



SERVING THROUGH SCIENCE



LABORATORY CONTROL—is a basic rule in the compounding of materials for U.S. Rubber Conveyor Belts. The particular type of synthetic rubber to be used is determined by the service conditions to be met; the ingredients are mixed with scientific exactness.



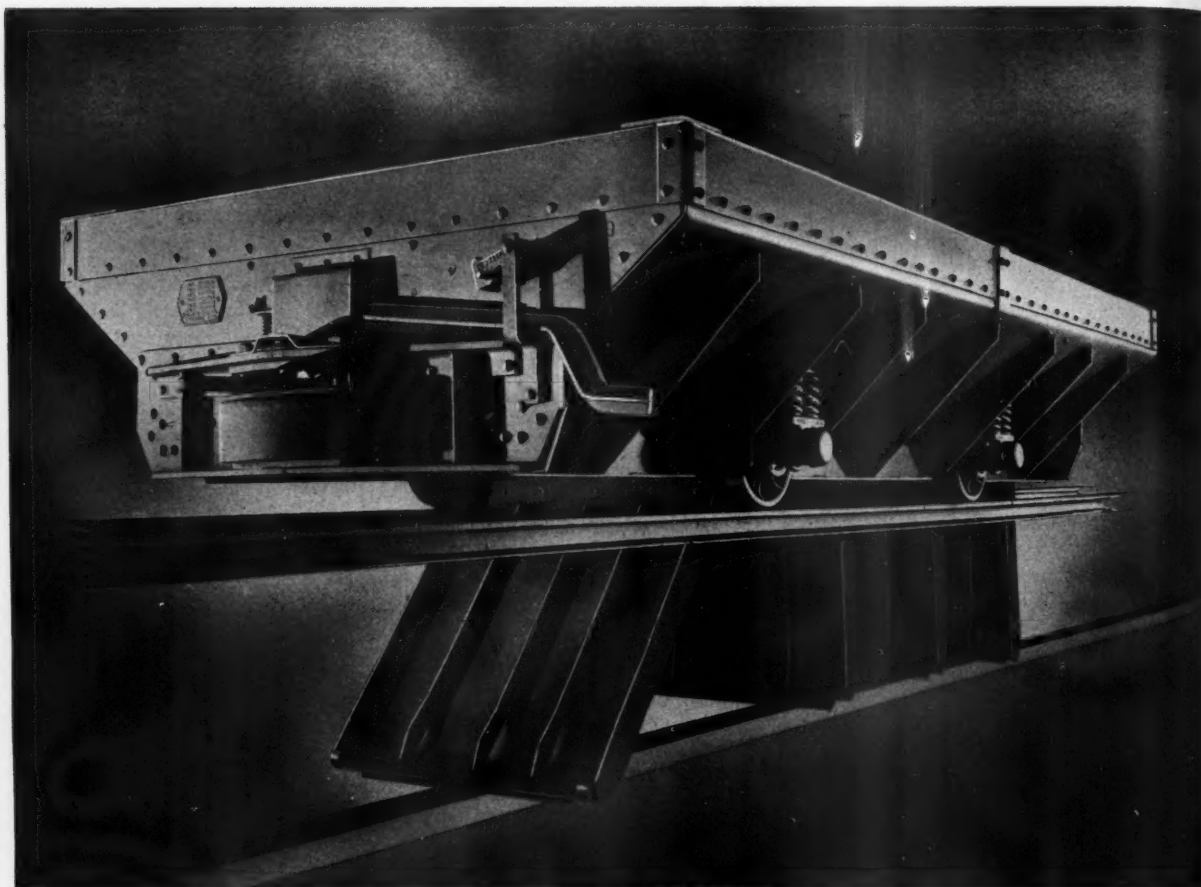
A GIANT GOES FORTH—Crated and ready for shipment this big fellow is on its way into service at an important coal mine. U.S. Rubber Conveyor Belting—hundreds of thousands of feet of it—is helping to handle big loads of vitally important products such as coal, limestone, ore and other bulk materials.

Listen to the Philharmonic-Symphony program over the CBS network Sunday afternoon, 3:00 to 4:30 E.W.T. Carl Van Doren and a guest star present an interlude of historical significance.

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE, ROCKEFELLER CENTER, NEW YORK 20, N. Y. • In Canada: DOMINION RUBBER CO., LTD.

★ If You Want 'em Wide . . .
--Take a Glimpse



**DO YOU KNOW
ABOUT OUR
LIBERAL RENTAL
PLAN?**

★ We tell you of the many advantages of S-D 1-2-3 "Automatics" for increasing production and for cutting production costs. But we go all out to back our claims by offering you these cars on a liberal rental plan. A plan whereby your savings will more than pay the rentals. A plan with an option to purchase the cars at anytime, should you later prefer to own them. You can't lose. Why wait? Write for full details now.

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

If You Need BIG CAPACITY . . . At This S-D 1-2-3 "Automatic"!

★ Here is another of those S-D 1-2-3 "Automatics" that make the mines that use them so successful.

This car, shown on these pages, is built for standard 56½-inch track gauge. It is approximately 9 ft. wide, 18 ft. 6 in. long, 42 in. high, and it will haul about 12 tons of coal each trip. The illustration below with the eight men perched across the car, will give you a good idea of its extreme width.

The first forty of these S-D 1-2-3 "Automatics" have just recently been delivered to a new mine, for operators who know from experience the many advantages of S-D 1-2-3 "Automatics" in assuring maximum tonnage at minimum cost per ton.

There just isn't any other car made that can equal the efficiency of the S-D 1-2-3 "Automatic." Case after case of change-over installations prove this. And, the men in the mines, who handle and load the cars, like S-D "Automatics."

It makes no difference about the size. We build these remarkable mine cars in any capacity to suit your particular requirements. And, regardless of size, every S-D "Automatic" is so designed to give you minimum dead weight, and, at the same time, ample margin beyond the actual structural requirements for hard service and long life. This is why S-D "Automatics" have long been noted for their ability to take the punishment of hard service down through the years.



Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

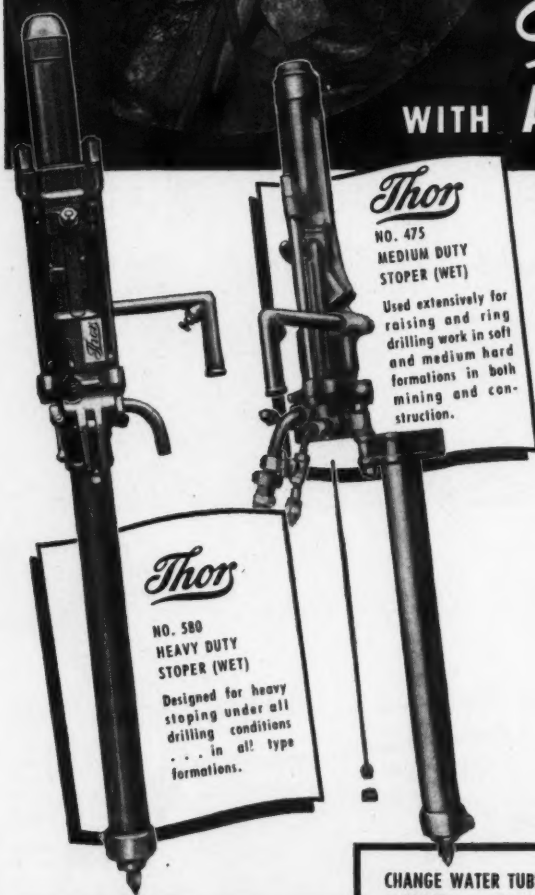
IN YOUR BATTLE FOR

LOWER COSTS

CONSIDER THESE
PROVED ADVANTAGES OF

Thor STOPERS

WITH AUTOMATIC ROTATION



Thor

NO. 475
MEDIUM DUTY
STOPER (WET)

Used extensively for raising and ring drilling work in soft and medium hard formations in both mining and construction.

Thor

NO. 580
HEAVY DUTY
STOPER (WET)

Designed for heavy stoping under all drilling conditions . . . in all type formations.

**CHANGE WATER TUBES
QUICK . . . EASY
RIGHT ON THE JOB!**

An exclusive feature of Thor Stoper Rock Drills is the time- and money-saving "Swing-Feed Cylinder" which makes it simple and easy to change a water tube right on the job without removing the machine from the operation.



Stoping in narrow vein, hard-to-get-at mining operations calls for the *reliable* automatic rotation of Thor medium and heavy duty Stoper Rock Drills that gets the toughest jobs done quicker . . . with less maintenance cost! These Thor Stopers bore into the tightest quarters and *clean with every turn* . . . operators can count on their *steady* performance!

LOW OPERATING COST

Low air consumption provided by special Thor Valve design puts every ounce of air that enters the machine to work! Positive automatic lubrication of all parts keeps the drill running smooth, steadily . . . prevents stalling or clogging.

LOW UPKEEP COSTS

Threaded chuck separate from the retainer body can be easily and quickly replaced - yet it is always a tight seal that prevents cuttings from entering working parts of the drill. The feed rod point and bearing, too, are separate parts that can be quickly replaced. Also contributing to low upkeep is Thor rugged steel construction and special heat treating of all parts for durability.

LOW COST PER HOLE

With *dependable* automatic rotation powered by the use of every ounce of air entering the machine, every stoping job is done faster, cleaner . . . more holes are drilled per shift!

For complete information and specifications on Thor Stoper Rock Drills and associated Thor mining and contractors' air tools write today for Catalog 42-A.

Thor

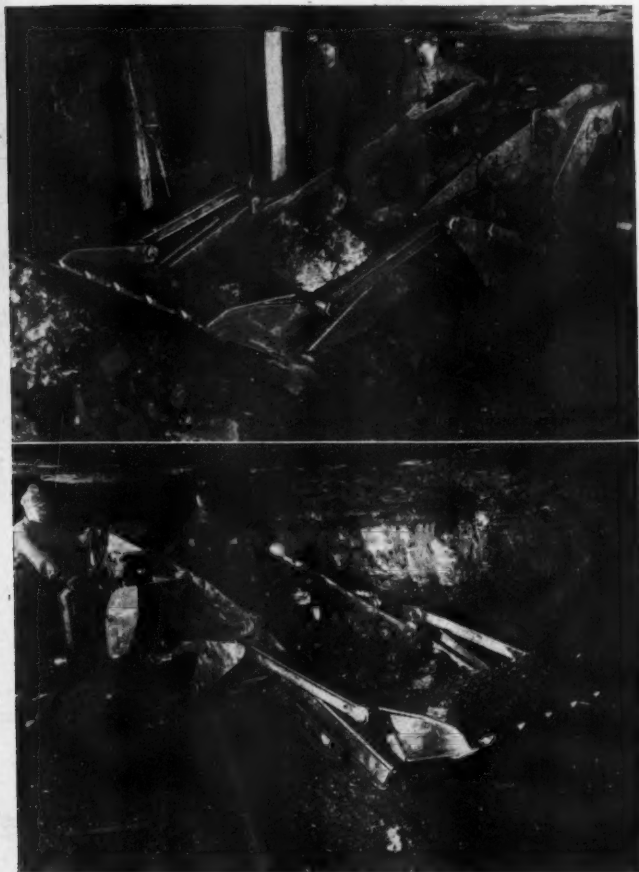
Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.
Branches in Principal Cities

You can take it ALL- when you take it with the Whaley "Automat"

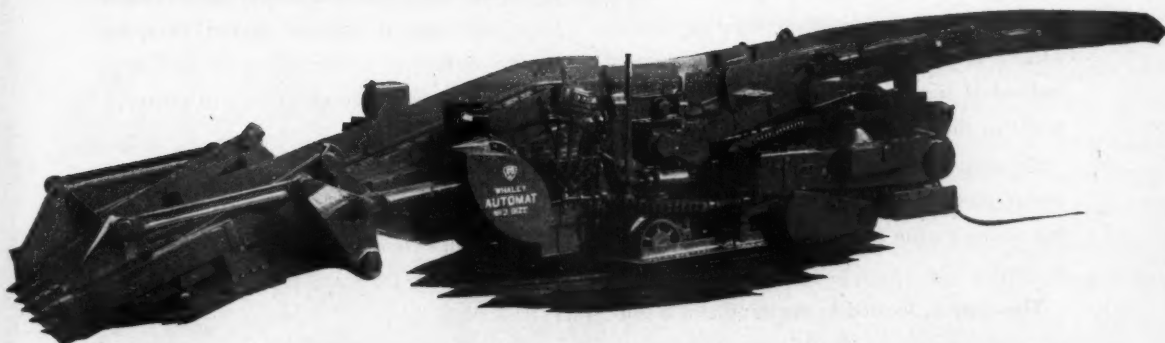


★ In many coal mines conditions warrant and make it desirable to do whole-seam loading in one operation . . . to take the coal and drawslate or partings all at the same time.

One of the major objections to whole seam loading, where cleaning facilities were available, has been due to the fact that the average coal loading machine could not stand up to the punishment of whole-seam loading and, at the same time, produce a satisfactory tonnage.

If you desire to do whole-seam loading, don't let the loading machine problem discourage you. You can do the job with the Whaley "Automat." With its natural shoveling action, the "Automat" will not only stand up but, even under the heavy duty of whole-seam loading, you'll get real tonnage. These facts have been proved conclusively by the millions of tons Whaley "Automats" have loaded and are now loading in this method of mining.

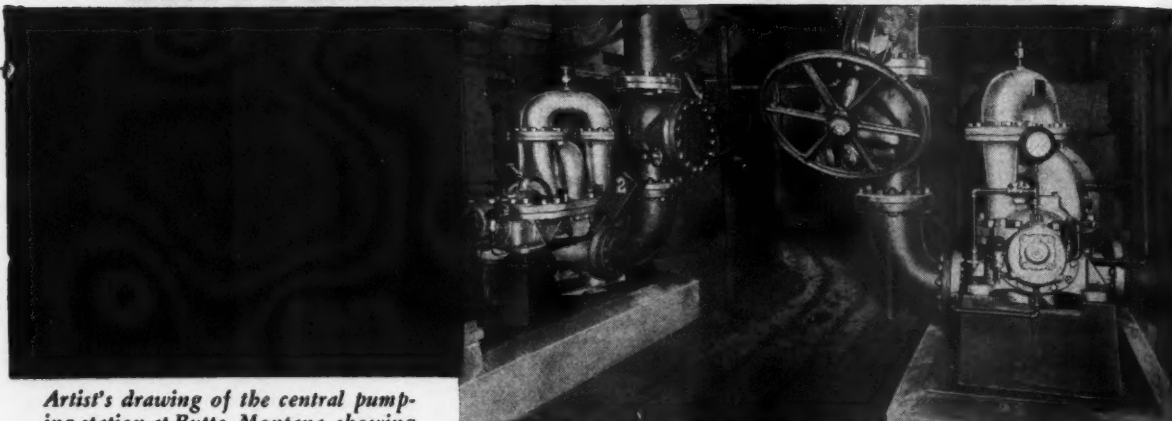
Yes, you can take it all when you take it with the Whaley "Automat." And, if you are contemplating the purchase of a new loader, you should get full particulars now. Wartime conditions have changed deliveries from weeks to months. Don't delay, write at once to Myers-Whaley Co., Proctor Addn., Knoxville 6, Tenn.



MYERS-WHALEY

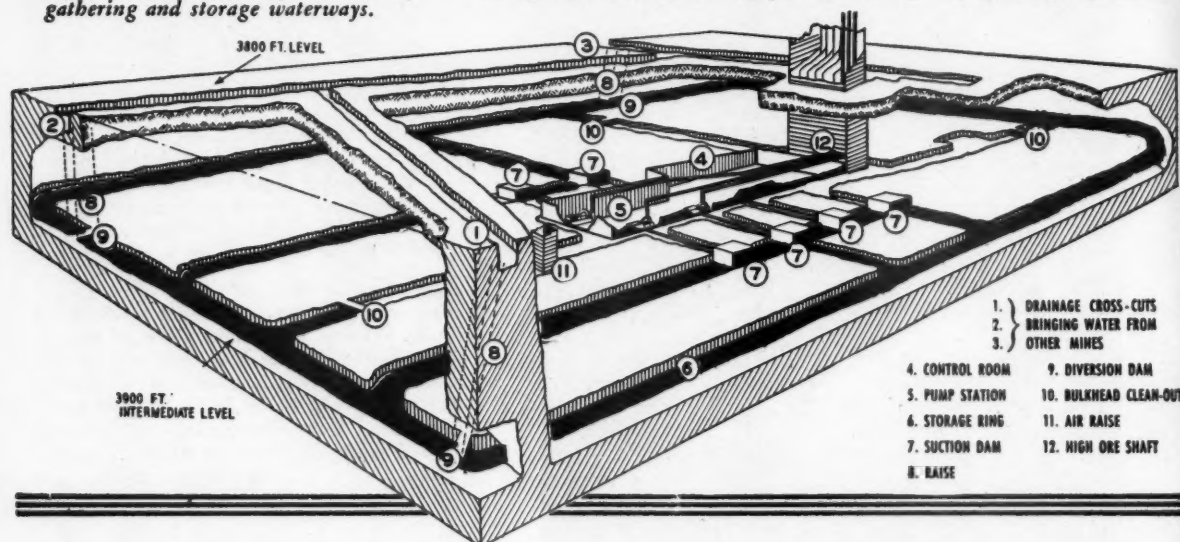
Mechanical Loaders Exclusively For Over 36 Years

CENTRAL PUMP STATION



Artist's drawing of the central pumping station at Butte, Montana, showing drainage crosscuts from other mines and the interconnecting network of gathering and storage waterways.

Two of the three 6-RT-4 pumps that handle the present pumping load. Each pump driven by a 700 hp motor has a capacity of 1500 gal per min.



Many mines in the Butte District had become far deeper than the two main pumping stations located at the 2800 ft. level. This necessitated individual stations at such mines to raise the water to the main pumping level.

To replace these individual stations, and to reduce pumping costs, it was decided to establish a single main pumping station at the 3800 ft. level.

This station, located in the middle of a stor-

age ring, is equipped with three Ingersoll-Rand Class RT 4-stage centrifugal pumps. Pumping to the surface is accomplished in four lifts utilizing pumping stations already in existence at upper levels.

There is a complete line of I-R pumps for mining service. Our engineers will be glad to give you full details. Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand

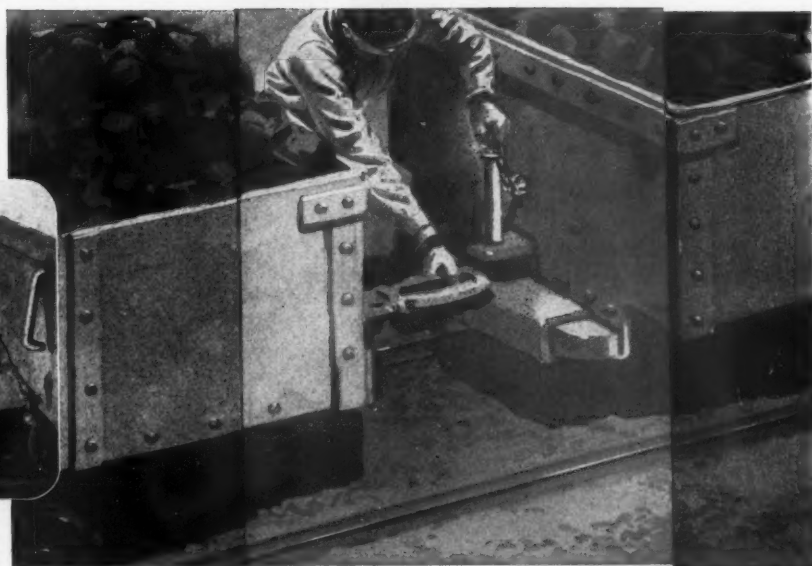
10-439

COMPRESSORS • TURBO-BLOWERS • ROCK DRILLS • AIR TOOLS • CENTRIFUGAL PUMPS • CONDENSERS • OIL AND GAS ENGINES

KEEP YOUR WORKMEN AWAY FROM THE **DANGER** **ZONE**



Cars equipped with O-B Automatic Couplers unite automatically upon impact without any manual assistance.



O-B Automatic Couplers Eliminate Need For Workmen To Go Between Cars During Coupling Operations.

Crushed hands and knees, frequent with out-moded coupling methods, take a heavy toll of production man-hours. Figures tabulated during the past years show coupling to account for one out of every five haulage acci-

dents. Keep your workmen away from the danger zone by installing O-B Automatic Couplers. No longer will it be necessary for them to go between the cars to manipulate treacherous link and pin hitchings. Cars couple automatically upon impact. Uncoupling is just as safely accomplished by a convenient lever located on the outside corner of the car.

If you are planning the purchase of new mine cars, either for a new opening or to augment your present production, investigate the safety provisions of O-B Automatic Couplers. We'll be glad to show you how O-B Automatic Couplers can be adapted to both your proposed design and your present car. Write today!



Ohio Brass
MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

KEEP BUYING WAR BONDS





THERE's always air for every purpose—if your compressor is a Gardner-Denver.

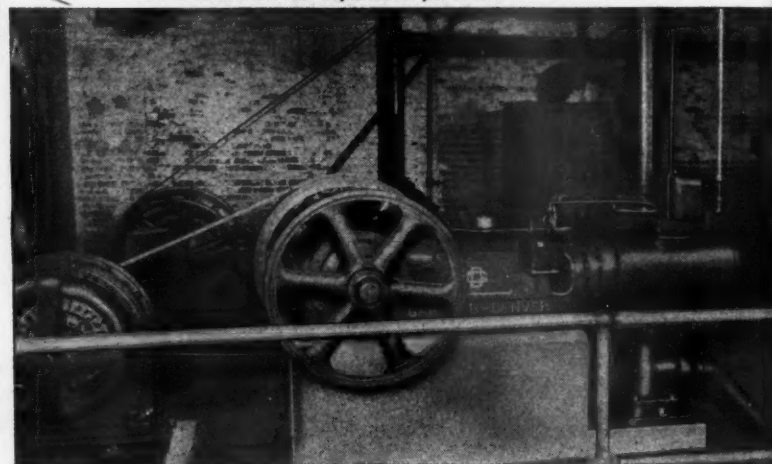
For these dependable compressors are designed to furnish a consistent supply of compressed air, regardless of the severity of service . . . to have plenty of air on hand for rock drills, sinkers, breakers, spaders and all your air tools at all times.

The rugged construction of Gardner-Denver compressors with vital parts cast in GarDurloy and Timken roller main bearings means low maintenance and long life.

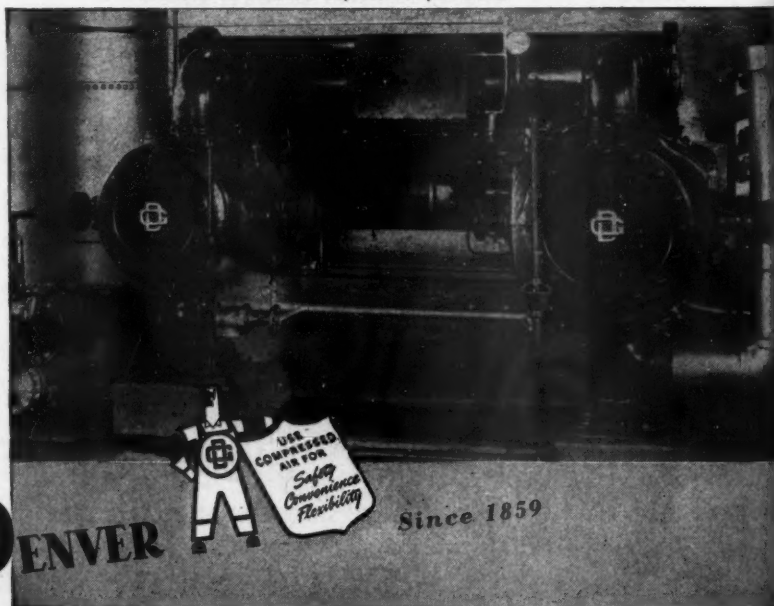
For complete information and specifications on Gardner-Denver compressors, for permanent or semi-portable installation, write Gardner-Denver Company, Quincy, Illinois.



Gardner-Denver "WB" Vertical Two-Stage Water-Cooled Compressor. Capacities range from 142 to 445 cubic feet displacement per minute.



Gardner-Denver "RX" Single-Stage Horizontal Compressor. Capacities range from 89 to 1292 cubic feet displacement per minute.



GARDNER-DENVER



Since 1859

Die

(a)

(b)

(c)

(d)

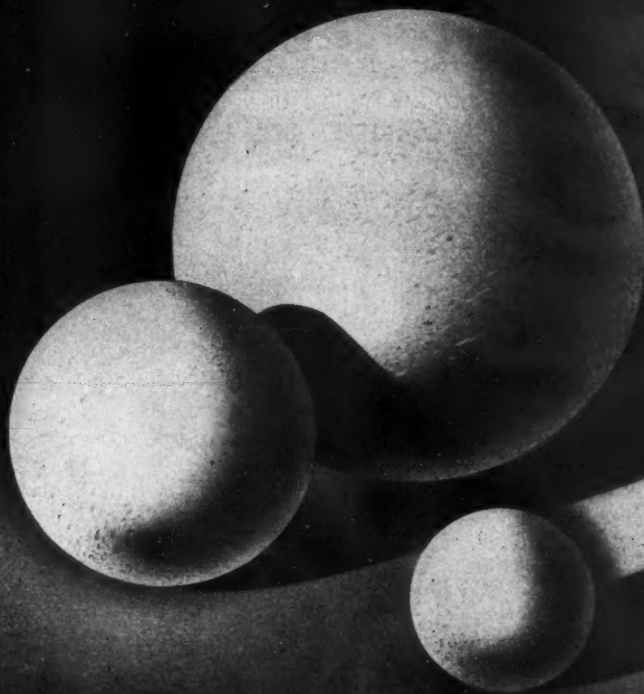
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W

CLIMAX
DATA

CI

**... the wear of steel in mining
equipment is a complex matter**



Did you know...

- (a) That steel balls hardly wear at all when run in an empty mill?
- (b) That different types of steel and different heat treatments are required for the best wear resistance for different types of ore?
- (c) That it pays to study the nature of your ore before taking the big step of specifying ball and liner analyses and heat treatments?
- (d) That the microstructure of steel for wear resistance is vastly more important than its chemical analysis?

Climax, by conducting research at its own mine, has discovered these and other important facts which can help reduce your operating costs.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING
DATA ON MOLYBDENUM APPLICATIONS.



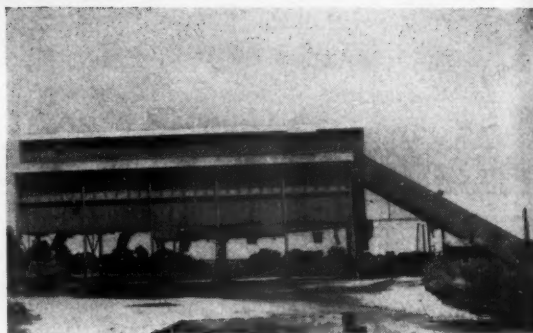
MOLYBDIC OXIDE, BRIQUETTED OR CANNED •
FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company
500 Fifth Avenue • New York City

Holmes . . . Storage and Preparation Plants



Holmes storage and preparation plants are designed individually to suit your location, conditions and requirements by engineers and fabricators backed by years of practical experience. They eliminate all manual handling of product. Material may be unloaded from R. R. cars to bin or conveyed direct from tippie without interrupting normal loading procedure. Material is lowered into storage bins by Holmes Spirals at an even velocity, reducing breakage to a minimum. Holmes Dust-O-Lators provide a positive mechanical screening to remove all dust as it is delivered to consumer's truck. Duff is conveyed to central storage bin for disposal, keeping a clean, attractive yard. Discharge gates are positive and automatic in operation, preventing emptying of bin by careless drivers.



ROBERT HOLMES AND BROS., Inc., Danville, Illinois

DESIGNERS AND FABRICATORS OF MINING EQUIPMENT FOR OVER 70 YEARS

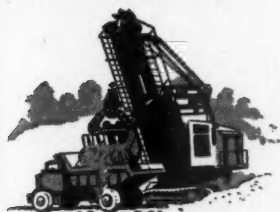
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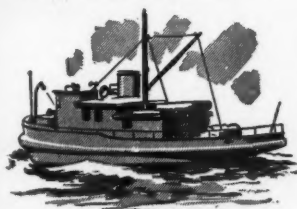
Auton
gines
power
station



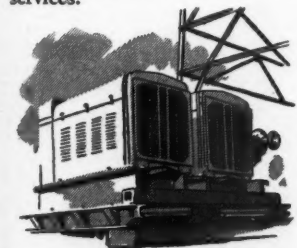
From the vast Mesabi Range—largest iron producing area in the world—an estimated 30-40% of the total ore output is hauled by truck. The large majority of these giant trucks are Cummins Diesel-powered.



Cummins built the first successful, heavy-duty automotive diesel. Today, in the 11 Far Western States of the U. S. A., approximately 90% of all franchise-operated, long-line, heavy-duty, diesel-powered trucks are powered by Cummins Diesels.



The world's first fully enclosed type marine diesel—now an accepted feature of marine engine design—was built by Cummins in 1928. Cummins Marine Diesels power fishing boats, work boats, pleasure craft and, today, many boats designed for the armed services.



Four Cummins Diesels, three of them seven years old, powered the rig which this year drilled the world's deepest oil well. In this and many other heavy-duty services—logging, construction, and material handling—Cummins Diesels draw the tough jobs.

Automotive models • marine engines for propulsion and auxiliary power • power units of all types • stationary engines • generating sets locomotive models

The End is Not in Sight

Even a casual comparison of the massive, lumbering diesel of yesterday with a trim, compact, modern-day Cummins Diesel will show that the diesel engine has come a long way in the 26 years that Cummins has been in the business. Yet, the end is not in sight because the same kind of thinking that led to Cummins' development of the original high speed diesel more than a decade ago promises still greater achievements in power efficiency tomorrow. This thinking is characterized by its refusal to become "set in its ways" . . . by its determination to fully explore every possibility for improving design, construction and materials . . . every possibility for giving you still more horsepower per pound and still more profits on your job through high speed diesels. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.





©PR. 1946 MACK MFG. CORP.

GOOD IDEA...FROM AWAY BACK...

It isn't hard to build a truck. But it's mighty hard to build a truck to match a Mack! And there's a reason. Back in 1900, John Mack set out to build the best truck in the world. His very first Mack stayed in service 17 years. Today we go forward with his same idea—backed by all we learned along the way. Big or little—heavy or light—no matter what type of Mack you own, you can be sure you'll get your money's worth in *work*. That's what "Built like a Mack truck" means. And the record says it means it *more* with every passing year.



Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.



Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!

Sullivan Scraper Haulers and the most important producer of Pink Manganese Ore



• War requires manganese... and modern methods and machinery again solve the problem. One of the most important and probably the largest producer of pink manganese ore doubled its output by using such methods and equipment. Much of the ore at this mine is handled by scraper hauler combinations. Here again you find Sullivan Scraper Haulers greatly in evidence. Scores upon scores of Sullivan Scraper Haulers, both air and electric, serve

this mine, and hundreds of others as well. Do as the low-cost, high-production mines do... use Sullivan and see the very real *difference*... SULLIVAN MACHINERY CO., Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.

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SAN FRANCISCO • SCRANTON

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HAULERS • HOISTS • LOADERS • CORE DRILLS
• CONTRACT CORE DRILLING



SULLIVAN

HOISTS • SCRAPER LOADERS • MINE CAR LOADERS

The Sullivan AAF-211

Only Sullivan Slushers give you these advantages

1. AUTOMATIC, FREE-WHEELING, ANTI-BACKLASH BRAKES. This means no drag on the brakes for the pull rope drum, and more power for scraping.
2. EASILY REMOVABLE FLANGED-MOUNTED MOTOR AND ITS BEARINGS. The motor can be removed as a separate unit for testing or repair and for inspection of hauler gears and bearings—without disturbing any bearing or gear.
3. DIRECT LUBRICATION TO ALL BEARINGS EACH OF WHICH IS THE SHIELDED BALL-BEARING TYPE.
4. EASILY REMOVABLE EXTERNAL CLUTCH BAND FOR SPEEDY REPLACEMENT OF CLUTCHLINING.

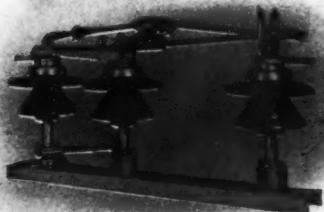
PLAN FOR RELIABLE SAFE

Power Distribution

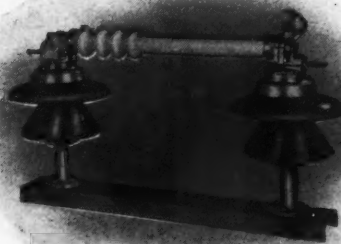
IN OPEN-PIT MINES
AND QUARRIES



Type LV Lightning Arrester



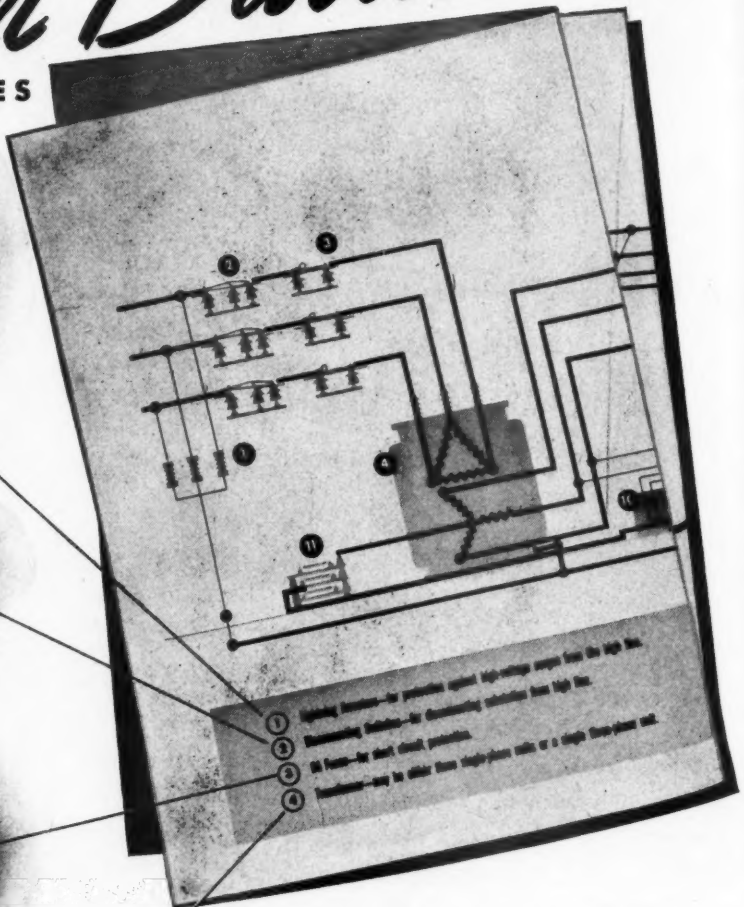
Type KA Disconnecting Switch



Type BA "De-Ion" Fuse



Type SL Distribution Transformer



A properly engineered electric power distribution system costs little more than one which is hazardous and unreliable. The reward is increased production—and the safeguarding of your employees' lives.

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MINING CONGRESS JOURNAL

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The Post-War Mineral Picture

WOVEN intricately into the post-war fabric of mining operations we find the thought and action-demanding problems of international control, security stockpiles, "hard money" and the American status as a "have" or "have-not" nation. Senator James G. Scrugham sounded a keynote on these matters recently when he reported: "I do believe, however, that we must plan our post-war trade, stockpiling program and tariff arrangements so as to give domestic operators the best possible break." To which, we add—and let's bend every effort to make this a reality.

Shall we have international mineral controls in order to effectuate barriers against future Hitlers and Hirohitos, or shall we abide by Article Four of the Atlantic Charter and possibly supply the where-withal for further conflict? How does the brand new oil agreement between Great Britain and the United States fit into the picture?

Shall we insure our strength to resist aggression by retaining adequate stockpiles of strategic and critical minerals and metals or shall we let loose the priceless stores which we will have accumulated during this war, to burst forth and submerge great segments of our industry?

Will the world economy be operated with fiat money or will we enjoy a feeling of confidence and security based on the tangible qualities of hard coinage? Bretton Woods has offered scant encouragement. We think, however, that the preference of a large part of the world's population for gold and silver currency cannot go unrecognized.

Where are we heading in the matter of this "have" and "have-not" controversy? Are our ore reserves dwindling to the point of exhaustion as some would have us believe? We have confidence in mining's future, but we emphasize the need of establishing conditions that will encourage efforts to extend existing mines and develop new orebodies. We deplore any action which may hamper freedom of mineral prospecting on the Public Domain. We praise the spirit behind the recent series of conferences of

small-mine operators in the West and the Western Governors Mine Conference which convenes as we go to press.

There is great work to be done by the champions of a self-reliant American mining industry, anxious to maintain its proper role in the economy of the nation.

Words of Encouragement

WHILE the bills continue to pile up behind the task of maintaining history's most capable war machine and while we ponder heavily the cold facts of reconversion, some among our legislators are able to see calmer waters ahead. Although it is not yet time to look for too many changes, we must nevertheless think about better days lest we become so accustomed to letting somebody spend the money we haven't got, that we as a nation collapse in the process.

Looming large as a defender of conservatism in government spending is Senator Harry F. Byrd with his praise-worthy Committee on Reduction of Nonessential Federal Expenditures. His constructive investigations can still do much to curb the present high rate of expenditures and to preserve the true functions of government. His reports should serve well to show us how far we are walking above solid ground.

Robert L. Doughton, chairman of the House Ways and Means Committee, recently began to swing into action on the question of post-war taxation. Clearly, policies necessary to the encouragement of risk-taking and reduction of present burdens on individuals and corporations are needed. He has predicted early repeal or modification of the 95 per cent excess profits tax against corporations, summary reductions in the excise taxes, and thorough-going consideration of taxes' impact upon enterprise. Even though a precise tax law revision must apparently wait yet this little while, we feel the helping hand of confidence in such welcome statements.

From yet another source, Chairman Ramspeck of the House Civil Service Committee, we learn that post-war cuts should reduce executive agency employment to about 900,000 from the present figure of about 2,900,000. This 2,000,000 cut is expected to take place within a year after the war ends.

Thus, from at least three important legislative committee chairmen, we hear that the brakes can and will be applied. With newer and more gigantic plans for federal spending arising ever and anon, we like the words of these statesmen, and hope they are truly prophetic. We have an impression, too, that some of the good work intimated might properly have been done long since!

Practical Observations on Main Line Haulage*

Well constructed track, good rolling stock and proper organization are basic needs in an underground transportation system

By GEO. R. HIGINBOTHAM

Asst. to Vice President in Charge Operations
Consolidation Coal Company

FROM the time of the first mining of coal, the means of transporting from the working faces to the outside has passed through various stages—from manual tramping, animal haulage to present-day mechanical methods and the means of conveyance has included sacks, baskets, wheelbarrows, sleds, carts and mine cars. From some of the records we find that the first coal mined in this state was taken out by sacks and baskets; previous to the Civil War, slaves carried the coal out of the mine and rolled it down the hillside to the banks of the Kanawha River. Oxen-drawn sleds and carts later replaced hand carrying; and mules with mine cars began to be used in 1870. At one time there were almost 8,000 head of stock in the West Virginia coal mines for both gathering and main haulage and in 1932 there were still 2,013 horses and mules underground, practically all of which were in gathering service.

Development of Mechanical Haulage

In the latter part of the nineteenth century the steam locomotive was introduced into main-line mine haulage and according to early reports, the first one in this state was installed at Cannelton in 1874. The number of steam locomotives gradually increased up until about 1905 when their use began to decline. Compressed air locomotives also had their day; however, this was of short duration and was more or less a step in the direction of eliminating flame in the workings of a coal mine.

Rope haulage began to be a popular method of hauling coal in the latter part of the nineteenth century. As a matter of fact, it is still rather

widely used, especially in the areas where the grades are excessive and several rope installations that have been in operation for over a half a century, are still giving excellent service. Some of these were of the endless type while a number had the tail-rope system. Probably the most successful rope haul in northern West Virginia was installed at the Montana Mine of the Fairmont Coal Company in 1897; this was a reversible endless type which created quite a stir in coal circles at that time.

Gasoline locomotives were in service for a brief time but were ruled out of the mines due to the noxious fumes exhausted. According to some authorities, internal combustion engines may make history in the coal mines in the not-too-distant future. I understand that a number of qualified engineers are attempting to develop something that would be suitable for mine service, but the internal combustion engine has to hurdle the obstacle of "permissibility" before it can be adopted for any general underground use.

The first electric locomotive for coal mine use in the United States apparently was at Lykens Valley Coal Company in 1887 at Lykens, Pa. This was a rather crude affair, taking the electricity into the motor by insulated copper wires. The current was carried in the mine on an ordinary 25-lb. iron rail which was suspended on the rib with a piece of sheet rubber between the rail and the support for insulation; the return current being the regular rails in the track. This method seemed to work out fairly well and copper trolley wire, of course, was developed later. Since the early models the electric locomotive has gone through various stages of development until at the present time we have units weighing over 20 tons that are hauling huge trips at a speed in excess of 20 miles per hour and many

companies are now seriously considering the use of high-speed equipment.

The newest development in underground transportation is the rubber belt and while there are several successful main-line units in operation, for the most part this equipment is being used for secondary and gathering haulage. It is particularly adaptable for concentrated mechanized mining with room conveyors or with mechanical loading and shuttle cars, collecting the coal from several working places to one point and loading a trip of mine cars.

Rails and Track Welding

Within the period of time which many of us can remember, the use of wood rail has been eliminated along with other obsolete methods of mining and most of the main-line track today is constructed of 40- to 80-lb. steel rail. There is a wide difference of opinion as to what the weight of steel rail should be on main-line haulage but this decision should be based on several factors; first, of course, is the weight of the rolling equipment, second is the speed of travel, and third is the type of maintenance that is to be expected.

There has been quite a lot of activity in welding rail joints within the last several years; our company has done some thermit welding in our Southern fields which from all reports is working out very successfully. Another successful installation is in an Ohio mine and is about three miles long with 60-lb. rail. The track was laid in 1936, hence they have had over seven years of experience on this job. Thermit welding was used. The track is on return air, with very little, if any, variation in temperature. A 25-ton locomotive with a 5- or 6-ton mine car is used on this track and the speed of the trains vary between 10 and 25 miles per hour.

According to a representative of this company, the maintenance cost of this track is approximately one-third that of a bolted track. In over seven years' experience they have had only two rail breaks and these have been from a foot to 18 in. from the weld. The company is completely sold on this type of track, not only from the standpoint of maintenance of their track, but from the standpoint of maintenance of rolling equipment. The claim is made that without the joints there is no shock to the wheels, which reduces the impact on bearings, etc. The cost of a welded joint in 1936 was \$6.76, which was approximately 50 percent greater than the installation cost of a bolted joint; however, I understand that there have been some methods worked out whereby the cost per welded joint has been reduced considerably since 1936.

* Extract of paper presented on May 9, 1944, to a meeting of the Monongahela Valley Coal Mining Institute at Morgantown, W. Va.

Ties and Tie Plates

The question of the correct type of tie seems to be pretty generally standardized. On say 60-lb. track with 42-in. gauge, the popular size is about 5 in. x 7 in. x 6 ft. In stepping up to 85-lb. rail, it appears that 6 in. x 8 in. x 6 ft., 6 in., would be the best size. There has been considerable controversy over the question of tie treatment but in deciding this question, it would appear that the life of the track should be the determining factor. For example, we place treated ties in our Class "A" category; the untreated wood is in Class "B" haulage and generally speaking, any track with a life in excess of 10 years would require the use of treated wood.

Another point in the construction of track which is highly debatable is the use of steel tie plates. I have in mind one three-mile stretch of 60-lb. main-line track laid on treated oak ties with tie plates which was constructed some 17 years ago and over which has traveled some 13,000,000 tons of coal. Several weeks ago I examined this three miles of track very closely and in 99½ percent of all the places I examined, the tie plates were frozen on the tie. All the motion of the rail was between the heel of the rail and the top of the tie plate. The rail was still standing in a vertical position and there has been practically no maintenance aside from track cleaning in these 17 years.

It is hard to say what would have happened to the ties from the rubbing action of the rail in all these years if

no tie plates had been used. While this track was laid in perfect alignment, and the original installation was as good a job as is done on the main lines of any railroad, there was always a certain amount of side motion, called "nosing," by the locomotives and cars. This "nosing" has a tendency to spread the tops of the rails and to cause the outside heel of the rail to dig into the top of the tie; sooner or later this results in the widening of the track gauge involving considerable maintenance work. It is practically impossible to do a first-class job of bringing a rail back to gauge and holding it in a vertical position after the ties have been worn. Moreover, in this stage of the life of track, there is considerable risk involved in high-speed traffic. Some authorities claim that tie plates should only be used on soft woods; however, it is my personal opinion that wherever a high-speed track of any permanency is to be used, a considerably better job of construction can be had with the use of tie plates.

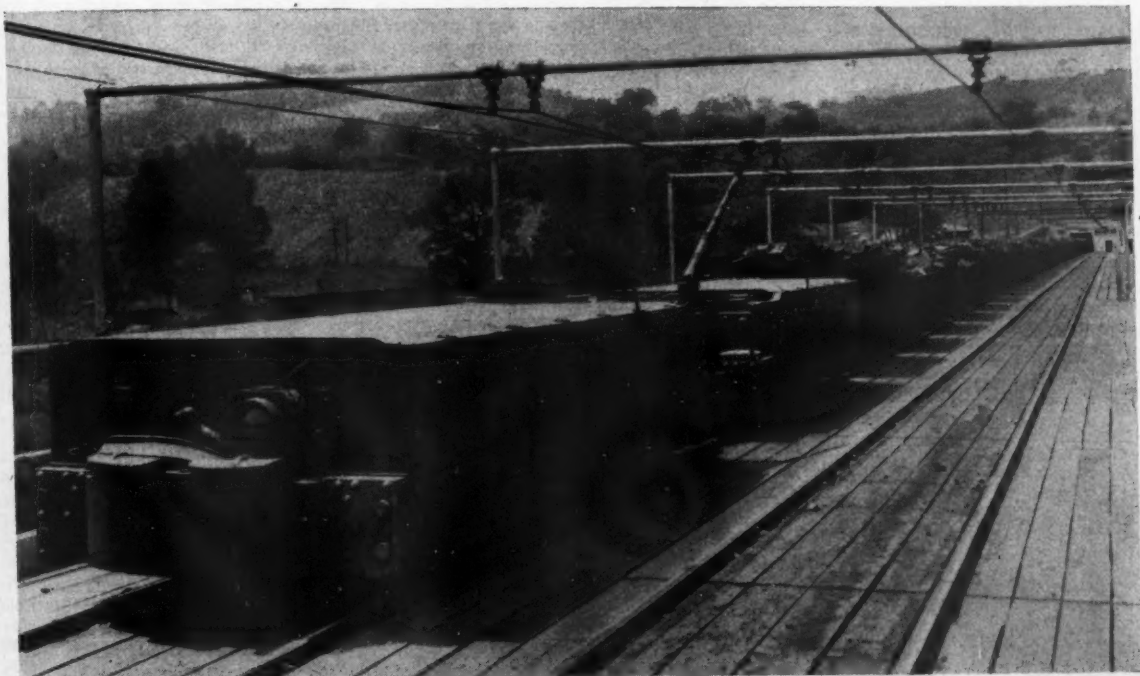
Drainage

The next big factor that should be given as much consideration as anything else in the laying of main-line track is the drainage of the road bed. Time after time I have seen instances where coal companies, including our own, have spent from \$30,000 to \$40,000 in laying a main-line haulage and yet neglect to provide drainage facilities. Under the three miles of main line, to which I have referred before,

there is a very hard bottom. During the construction of this track, there was a large amount of money spent in digging a ditch in a parallel entry; this ditch was originally cut about 1 ft. below the bottom of the ties and had to be drilled and shot its full length. At the time there were any number of people who thought this was a foolish expenditure, but in the course of the 17 years we have found that this ditch had paid for itself time and again.

On the other hand, there is another stretch of approximately three miles of main haulage which had exactly the same care in its construction as had the one to which I have been referring. The mine floor, however, was soft and in one stretch of the haulway the bottom of the ditch was actually some 3 or 4 ft. higher than the road-bed of the track. Now this ditch has carried the water for all these years without any trouble but we have had a moist condition in the road bed. It would be impossible to hazard a guess as to the amount of money we have spent in the maintenance of this piece of track due to poor drainage.

A typical example of what poor drainage means is shown in a stretch of 6,000 ft. of main-line track which we are having to repair this year. We have appropriated \$12,000 to do this job. I am positive had the road bed been properly drained when the track was originally constructed, we would not have faced this problem. The track incidentally has been in place less than 10 years.



A well built outside haulway of Consolidation Coal Co.

Ballast

The next big factor in track construction is ballast, which is a subject that has been argued by practically all mining men. It seems to me the main consideration in putting in track ballast is to see that there are sufficient voids in the material to give proper drainage. If anything less than say $\frac{3}{4}$ to $\frac{1}{2}$ in. is used on the bottom of the road bed, it is doubtful whether it will properly drain itself. Some companies specify the use of crushed limestone for their Class "A" main-line track. You cannot go wrong in using this type of material, but I have seen mile after mile of track ballasted with "red-dog" that seems to serve the purpose very satisfactorily. However, the lighter and finer ash eventually will work up into a muck in the event there is any excess moisture in the road bed but as long as the road bed is properly drained, it seems to me that "red-dog" does about as good a job as crushed limestone. However, I have often doubted the amount of savings claimed for the use of "red-dog," because quite a lot of labor is required to load and unload it and I have often wondered if we have analyzed this cost sufficiently. Crushed slag is another ballast that is being widely employed and mine rock, of course, is used very extensively and we will have to admit, economically, by many coal companies.

Large Mine Cars and Locomotives

The question of the size of mine cars for haulage is, of course, a subject which has been discussed ever since mines have been operating. The trend of coal transport equipment seems to be toward larger and larger units and I presume there will be a limit reached some day to the size of mine cars that can be used successfully. Today the biggest cars with which we are familiar hold about 10 tons of coal and are being used in both high and low coal. We used to think that there was a definite limit on the amount of top we could brush but there is a company in the southern end of the state operating a 36-in. coal seam, which expects to use a car that will require about 7 ft. of height.

I have tried to make a comparison of haulage results in mines using different size mine cars. For instance, we will take two mines: one operating in a 32-in. seam and one in an 8-ft. seam, and both having mine cars of less than 2 tons. The cost per ton per mile on main-line haulage in these two mines is almost twice that of mines which use cars with a capacity of 4 tons. I further tried to develop the cost per ton per mile in mines with a 10-ton car. This seemed to be pretty much in line with the cost per ton per mile in the mine using the 4-ton car and the only thing to which we could

attribute this fact was that as a general rule the shorter the main-line haul the higher the cost per ton per mile. This study revealed that the main-line haulage cost seemed to flatten out in a direct line after the second or third mile; in other words, for each additional mile the coal was hauled we could almost figure a definite cents per ton additional cost of production.

The question of how steep the grade should be before the use of a locomotive is discontinued is pertinent. This again depends largely on how much tonnage is involved and type of equipment, along with many other factors but it is doubtful if the present equipment would be practicable at say 20-miles-per-hour speeds, on grades in excess of 1 percent. We are operating equipment on grades up to almost 3 percent on our main lines which is excessive and most certainly a reasonable expenditure to reduce it would pay dividends. There are some companies who operate main-line locomotives on grades up to 6 percent and some gathering equipment up to 14 and 15 percent. However, this is rare and as a general proposition not the most successful; I notice that on grades of that kind or steeper in the Pennsylvania fields, the operators usually resort to rope haulage of some nature.

The size or weight of main-line locomotives is following the same trend as the mine cars have taken, which is faster and heavier; there are successful installations at the present time where main-line speeds are in excess of 20 miles per hour, and I am convinced that this will be a common practice within the very near future.

Trip Dispatching

One of the factors which goes hand in hand with main line haulage, yet is not a part of the main line equipment is the dispatching systems. There has been a tremendous amount of improvement in mine dispatching over the last fifteen years. Up to that time it was entirely up to the motorman to get in and out of the mine the best way he could; we of course had what we called a boss driver, who if you will recall was usually a high-powered motorman or mule skinner rather than a man who was attempting to establish a systematic method of regulating traffic. The first signal blocks that I had experience with were simply crude systems of hanging up a red or white lamp some place which would indicate whether or not a motor was on a main line. This system served its purpose when mines were comparatively small and the main-line haulages were decidedly shorter than they are today. However, since coal is now being hauled anywhere up to five and ten miles underground, we have to have a system that is comparable to

that of a small railroad. As a matter of fact, I believe that a well operated mine haulage is really more efficient from the standpoint of less lost time than most railroads; this may perhaps sound like a broad statement but, from what I have been able to observe, railroads would most certainly have to change their style of work if they kept up with our motormen in the coal mines.

There are several different designs of dispatchers' sheets. It seems to me that practically all a dispatcher needs to know is where a half dozen main line locomotives are, how many cars of coal and empties they are hauling, what the haulage situation is on each of, say, 7 to 20 sections in a mine, where all the section bosses, fire bosses, and mine foremen are and what they are doing. If you have listened over the telephone to the amount of information that passes over a dispatcher's office in a day, you will find that he is one man around the coal mine that should and generally does know more about what is going on than anyone else. This is a job that requires high degree of native intelligence and a man who knows his coal mines from A to Z.

Most coal mines have found that the block system and telephones have worked hand in hand for handling traffic and we would be lost in trying to operate a good sized mine without either. While acting as a dispatcher, I have handled traffic in a mine day after day by telephone when the block signals were not working. We went through the agony of using mine telephones for several years until we learned that we simply had to have some form of heat to keep them in service. There may be such a thing on the market today as a mine telephone that will operate without a lot of maintenance but so far, we have never been able to find one.

One of the last factors, which we have given a lot of thought in operating our main line haulages, is that of safety. Over a period of years we found out that we simply had to develop a set of safety rules that insist on a reasonable compliance. I believe every progressive coal company today has its own idea of what constitutes safety in haulage and is making every effort to reduce accidents.

Acknowledgment

In preparing this paper I have borrowed generously from D. L. McElroy, Chief Engineer of Consolidation Coal Co., and have also gotten some very valuable information from C. C. Hagenbuch, Engineering Assistant to the Vice President of the Hanna Coal Co., in Ohio. Mr. Hagenbuch has devoted a large part of his life to the study of mine track and I believe he is as well qualified to speak on that subject as anyone in the industry.

Operations of Golden Feather Dredging Company

A flood control project at Oroville, Calif., has proven a worthwhile mining operation and has given the city an excellent protecting levee

THE Oroville dredging basin situated just below the city of Oroville, Calif., on the Feather River, was the location of the earliest gold dredging operations in California, starting in about 1898 at the inception of the gold-dredging industry. The dredgable area comprised about 7,000 acres, and was divided up among many small companies. The city of Oroville refused to allow any of these companies to dredge the river in front of town, fearing possible inundation from the irregular distribution of the dredge tailings.

At this location the stream bed from bank to bank varied in width from about 1,000 ft. at the east end, or upstream, to about 1,200 ft. at the lower end, or downstream. The river itself hugged the north bank, while in the center of the stream bed a large island had accumulated, comprised of gravel that had washed down into this first catchment basin from the river in the Sierra, which, of course, has a heavy gradient, until it strikes the floor of the valley. As it happens, this point was at the upper end of the city just below the Chico bridge. It can be readily understood that the coarse gold would lodge in the crevices and bars of the river further up in the foothills while the finer gold would be carried down by the swift current and would lodge in the first area where the level valley would be encountered; and this was, of course, opposite Oroville and below it. As in the case of all the other torrential mountainous streams, a dredging area was formed wherever the swift stream from the foothills met the valley.

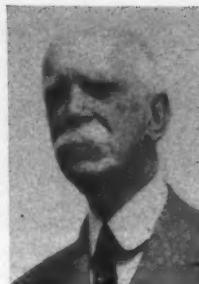
Conditions Needed Correction

In front of the city the river itself was about 200 ft. wide in ordinary times, and hugged the north bank. A large island, or bar, existed in the center of the stream bed, and on the south bank was a sort of back channel which was only overflowed when high water came.

Oroville was not in a good situation when the Golden Feather Dredging

Company started operating in February of 1940. California winter weather is impossible to predict, and every so many years high water approaching a flood is sure to appear. The city is located right on the south bank of the river, and was protected only by a light flimsy levee comprising 8-in. thick small concrete blocks, backed by a narrow earth embankment, all of which had been installed at a heavy cost. If the flood water ever got over the concrete block face, the earth backing would easily be washed away, the entire levee would be quickly wiped out, and the town would be flooded and with no protection whatever. As the principal business street is only one-half block from the levee, the damage would have been great and the business portion of the town might easily have been wiped out. It so happened that during the last high flood, the water came within 1 ft. of going over the entire lower portion of this levee. Consequently there was urgent need of additional protection.

Having knowledge of the situation from the fact that in 1900 Colonel



By E. A. WILTSEE

General Manager
Golden Feather Dredging Co.

Doolittle, John Hays Hammond and the writer had organized the Oroville Gold Dredging and Exploration Company, which successfully dredged a large area below the town, I was of the opinion that this particular area must contain gravel of good gold value. I was confirmed in this by Mr. R. W. Derby, who operated one of the early-day gold dredges, and who stated that in his opinion this gravel would be found to average about 25 cents a cubic yard. The entire stream bed was prospected by us and found



Dragline and floating boat in pond. North levee construction during 1940



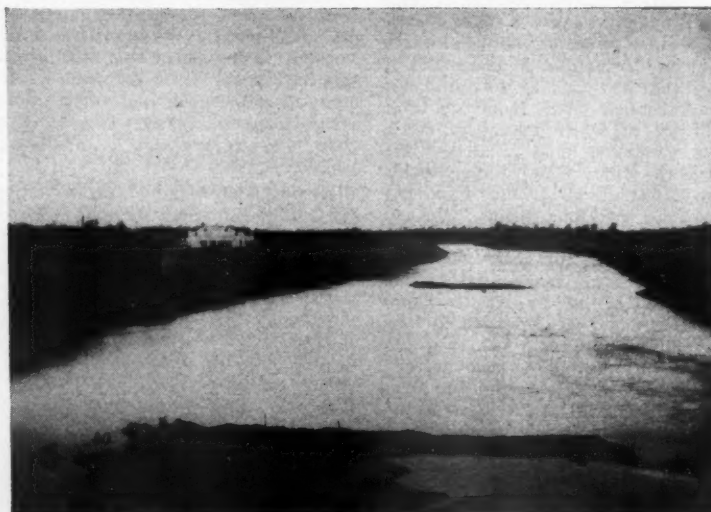
Floating recovery boat, showing bucket dumping into hopper. Revolving screen and stacker are in operation. Riffle areas for gold recovery extend out on both sides under screen

to average 25 cents a yard in gold value.

The situation as regards ownership of this area was peculiar. The Government had granted two patents, each running to the center of the stream: one on the north bank, which was an old Mexican grant, and the other on the south bank, which became the city of Oroville. The division line was the center of the river. As the result of this fact, while it was easy to secure options on the property on the north bank, the ownership of the largest part from the center of the river to the south bank was vested in the lots which ran along the lowest street next to the river and extended across the river bed to its center. This comprised nine-tenths of the dredgable area. There were 20 of these lots, and it was necessary to secure all of them before we could proceed to dredge. Unless we secured every one of the lots we would be blocked off from dredging up the stream, the only way in which values can be properly recovered. The acquisition of all these various narrow lots was a long and tedious process, and occupied between three and four years.

For some reason or other the citizens of Oroville were greatly opposed to gold dredging, although the industry had made it a prosperous town in earlier years. We felt that when we had once shown them what we could do in dredging this area with a large and suitable dragline plant, that their opposition would disappear. Acting on this view we decided to start operations on the north bank. This was also necessary because unless we secured a permit from the city of Oroville it would be impossible for us to dredge nine-tenths of the area which was vested in the city lots. We, there-

fore, after endeavoring futilely to get a suitable contract, decided to start operations on the north bank and commenced initial dredging in February, 1940. We had secured an additional 17 acres adjoining the river on the north bank; a procedure necessary in order to operate in this area during the high water and in the winter, until we had put the stream in such position and in its permanent place, so



The river is now between two levees, 475 feet apart, after moving over from the north bank to permanent position. River has been cleared 30 feet to bedrock

that it was safe to operate in the river. There was one great obstacle, and that was that the bed rock of this north bench was 46 ft. higher than the river bed rock. Thus it was necessary to move the dredge up on this bench in going out of the river and take it down when we returned into the river in the summer time. Of

course, this sort of an operation would have been impossible with a bucket-line dredge, and could only have been executed by one of the adaptable dragline plants.

Equipment Required Special Selection

The plant consisted of the following: A Bucyrus-Erie 120-B dragline which, of course, does the digging and which swings a 6-cu.-yd. bucket; a recovery boat floating in the pond, which follows the dragline, constructed by the Bodinson Manufacturing Company of San Francisco. Boat dimensions are as follows: hull—length 72 ft., width 50 ft., depth 4 ft. The boat is an excellent one and especially constructed with a strong hopper and a 45-ft.-long by 6-ft.-diameter revolving trommel or screen, together with sand elevators. The stacker which conveys the coarse material which refuses to go through the $\frac{3}{4}$ -in. holes in the screen, up on the tailings pile, is 115 ft. long with a 36-in. endless rubber belt. The riffle area, where the gold is recovered, as in all our dredges, did not consist of a single deck, but was comprised of three decks of riffles 6 in. above each other, thus giving three times as much riffle space as could be obtained in one of these boats as they are ordinarily equipped. This ensures excellent saving of gold. The boat is moved with headlines and tail lines operated by a winch and, as

shown by the photograph, is up to date in all respects.

The plant also included three RD8 caterpillar tractors, and a LeTourneau carry-all. This equipment, which is not needed in ordinary dragline operations, was necessary because we had to level off all tailings piles and give a perfect surface to the resultant

area, as it was necessary to prove to the town what we could do when the time came to build the south levee in front of it. The plant also consisted of office, machine shop, clean-up and melting plant, and all necessary store rooms and accessories, all in movable buildings.

We started operations in February, 1940, the dredge being constructed on the 17-acre lot on the north bank. This was in reality an ancient channel, converging upon the river at this point. The upper portion of it had been hydraulicked off before the cessation of this industry was enforced. The ground was very rough, with some parts 50 ft. higher than others, and it was necessary to level it off with tractors and carry-alls. The depth to bed rock at its maximum was 50 ft.; and, as usual in ancient river channels, this was heavy, stiff, digging compared to the gravels in the stream bed. However, we dredged it successfully until in the month of June when it was time to go into the river. It took us almost a month to get down from the north bench and well into the stream.

Plans for North Side Succeed

In order to dredge successfully on the north side, we had to dredge up the running stream, and since this would have been practically impossible, our plan comprehended putting a dam in the river up near the bridge at the head of the deposit and throwing the summer stream over to the south bank in front of the town where it would do no harm. By this means we could dredge upstream in still water. It was also necessary to put the river in its proper place, and this was done by digging to bed rock as we went up and leaving a strip in the center of the river basin 200 ft. in width. The gravel from this operation was used in the north levee. This made half of the 400-ft.-wide strip in the center of the river bed, to be the ultimate permanent location of the river as shown in one of the photographs. This was successfully done; and the result was an excellent levee on the north bank, demonstrating that we could make it to the required height above low water, namely, 46 ft., and as level as a baseball field.

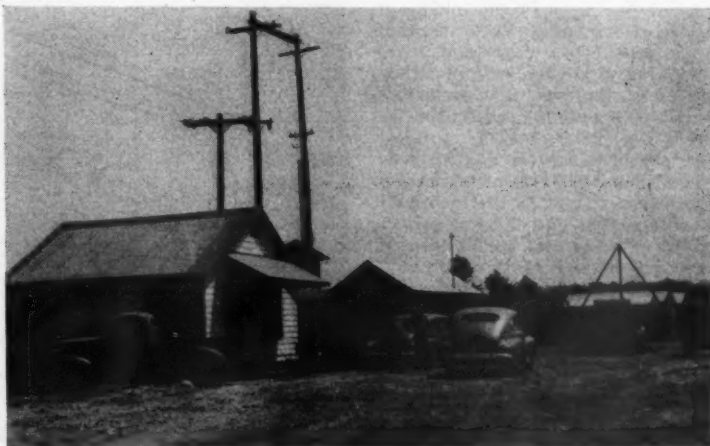
By this time the city was convinced of the benefit that we could be to it, and with the advice of their consulting civil engineers from San Francisco, entered into a contract with us in March, 1941, by which we were to construct a levee on the south bank in front of the town not less than 125 ft. wide, reinforcing their original levee, our levee to be 6 ft. higher than theirs and 46 ft. above low-water mark, the top to be surfaced with sand, together with a levee along the north bank of similar height and leaving a streamway in the center of the



Completed south bank levee is 125 ft. or more in width and 46 feet above low water mark. City in background



Finished levee is surfaced with sand. City is now planting trees



Construction buildings are all portable. These include office, machine shop, blacksmith shop, retort house and storehouse

river bed over 475 ft. wide. This streamway had to be dug to bed rock, and all gravels thus obtained must be used in the construction of the two levees along the north and south banks. Also, our contract provided that when this was finished we should go downstream, continuing the levee, and take out a wide bar that had formed where the river had made a sudden turn to the north. This bar was based on a lava tufa bed rock and was such a serious menace that every year at high water the lower part of the city was inundated for a considerable period, making it temporarily impossible to use the main road to Marysville.

We received no compensation whatever for the levee, but, of course, retained the gold recovered, as we either owned or leased the entire river bed. And, as the city happened to own several lots and the extension of the streets out into the stream bed, they ultimately received from us a royalty of \$11,000 in addition to the construction of the levee, gratis.

War Presents Difficulties

After dredging upstream in the summer of 1940, we again retired to the tract on the north bank, made the 46-ft. ascent thereto and dredged there during the winter of 1941. Returning to the river in the summer of 1941, we were occupied on the completing of the north bank levee when the Pearl Harbor affair occurred. Then, although all gold-dredging operations in California were shut down on October 16, 1942, there was granted a six months' extension by the War Production Board because of the nature of our work in the protection of the city. At the expiration of this in May, 1943, it was apparent that a direct appeal to the War Production authorities in Washington would be necessary so that the exact situation would be understood and this most beneficial work would not have to stop while we were in the middle of it. The people of Oroville realized what a benefit our operation would provide them and they were much exercised over the fear that an extension of our permit would not be granted.

The situation was a critical one. We had completed the lower portion of the levee in front of the town and had consequently dug the streamway over 400 ft. wide and 30 ft. deep to bed rock. If our work had been stopped, the levee already constructed would have been in danger of being washed away, since the force of the current is impinged on the south bank from a turn of the river above the bridge. Furthermore, on account of the deep excavation in the center of the stream, the gravel in the upper portion (necessary for the upper or easterly part of the levee)

would have been washed down into this excavation and lost. Beside this it would be impossible for us to drag gravel up stream, with which to effect construction of the levee. The explanation and photographs furnished the War Production Board proved conclusive evidence; and they immediately extended every courtesy, comprehended the situation perfectly and not only gave us the permit, but in order to insure the retention of our crew, took the matter up with the Manpower Commission, with the result that this project was looked upon as a "flood control project" and not a gold-dredging operation. It was also considered as being most vital to the safety of local lives and property. Consequently, it was regarded, and is today, by the Manpower Commission and War Production Board, as an essential industry. Through these facts and the citizens' very earnest demands, our project was allowed to proceed.

In order to construct a levee 46 ft. above low water and 6 ft. higher than the old levee, it was, of course, necessary to add the gravel from the central portion of the stream (which we were digging to bed rock), to the gravel produced from that portion nearer to the bank. This was done by operating our dragline far out into the middle of the stream and throwing the gravel into the hopper, thence through the boat and up the stacker which was tailed-in straight toward the bank. Only by doubling up in this manner could we construct the levee to the required height with a width of from 125 to 150 ft.

In constructing this levee and working upstream, we had little difficulty until we approached the upper end. As we proceeded up the river, we began to encounter boulders which, of course, had been borne down by the



S. J. Norris, Jr., suveyor and officeman

swift flood waters above the Chico bridge. Naturally they nested in the first flats where the current became slow. It required all our equipment to get these boulders out of the gravel, using our three tractors to push them up the bank and pile them against the bottom of the old levee, a procedure directed by the city engineer. Of course, our yardage was much cut down by handling these boulders, but it was compensated for by the fact that the gravels around the boulders were richer than those further down stream. The levee in front of town was completely constructed about the middle of October, 1943. It then became necessary to drop our plant downstream and continue the levee down to the bar below the town. We were under contract to remove this bar. This gave Oroville complete protection because this levee was continued down to a point where the river widened out and was 7½ ft. lower than just above the bar. An even grade was produced when the bar was removed, and the work done had the effect of lowering the river at the lower end so that a good current was effected when the water traversed the levee in front of town. This avoids deposition of silt in mid-stream.

When our permit expired on the 15th of March, 1944, the War Production Board granted us an extension to the 15th of December in order to enable us to complete the removal of the bar; this work is now in progress and apparently will be finished in good time. There will then be complete protection along the entire front as well as so far downstream that no

(Continued on page 27)



Harold L. Kumle, superintendent of all operations



The coal outcrops in the creek. As it appeared at high water before operations began



By J. W. BISCHOFF

Special Engineer
West Virginia Coal & Coke Corp.

Coal Stripping Supplements Deep Mine Production

An interesting example of utilizing a combination of natural conditions and existing facilities

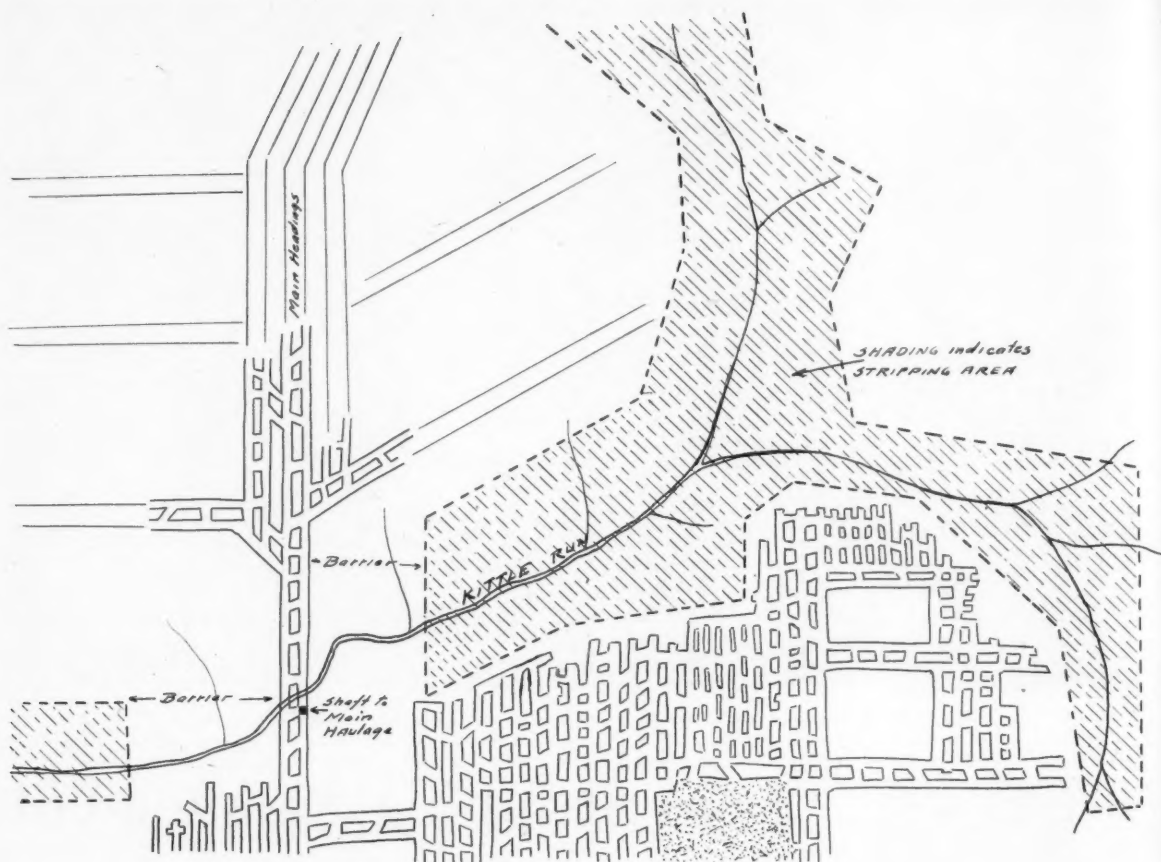
Stripping in a Creek Bed

THE past year has seen a development, comparatively new in mountainous regions, but one that counts its life by decades in other coal producing fields, which has contributed no little to the production of that vital source of energy, coal, especially important in view of the pressing need brought on by the war. We have in mind "strip mining" and we hope to present in this article a description of an operation of this kind, which, in our opinion, has several features so different and novel as compared to other operations of this nature as to merit special mention.

One visualizes the conventional contour stripping in hilly or rolling terrain by following the crop line of the coal, that is usually well above stream level, taking different lifts until the resultant overburden becomes prohibitively heavy. In the operation described here, the coal outcrops practically in the bed of the stream and in the first overburden removal the course of the creek channel is followed; the cover being very light, and during most of the season the water flow is practically negligible. Only three days have been lost from this cause since May 1. Subsequent lifts are taken on either side until the amount of material to be moved reaches the stripping limit, but by the same token, recovers the coal to

the point where the cover is sufficient for deep mining.

The West Virginia Coal and Coke Corporation has been producing coal by ordinary mining methods in the Roaring Creek section of Randolph County since about 1900, in the Middle Kittanning seam. The main opening at the tippie of the Norton mine is approximately $2\frac{1}{2}$ miles from the stream shown on the accompanying reproduction of the mine map and known as Kittle Run. The overlying strata varies up to 180 ft., until in Kittle Run the coal is in or near the bed of the stream; the banks on either side of the creek are not steep but gently sloping, and the overlying strata is too weak to allow deep mining. On this map it will be seen that the mine workings have stopped at the "cover limit" of 35 to 40 ft.; two



Mine map showing light cover area for stripping

of the main headings have driven narrow under the creek and the future underground development is projected to work the territory beyond. The map also shows the boundary of the area proposed for stripping along the creek and its tributaries.

Maintaining Coal Quality

The seam has a thickness of about 6 ft. and immediately overlying the coal is a strata of boney coal about 1 ft. in thickness, extremely resistant to erosion. This, as mentioned before, being the approximate bed of the stream, has fully protected the underlying coal as it shows no outward appearance of weathering or deterioration and laboratory tests confirm this. The operating management of the company being aware of these facts, sensed the economic value of a stripping operation in this locality that would enable them to recover hundreds of thousands of tons of coal that would otherwise have been irretrievably lost. Accordingly an arrangement was made with the general contracting firm of C. C. Dodd and L. G. Archer, of Spencer, W. Va., who are now successfully removing the coal



Drag line uncovers coal in stream bed at location shown on preceding page

and delivering it to the coal company as described later.

Since the company's sales department handles this production, they naturally were concerned in getting a clean product and of course knew that there are many open pit operations of long standing that have adequate preparation facilities and are producing high quality coals. So in order to assure that the strip coal would have proper preparation, a plan both unique and economical was designed to utilize the main haulage of Norton mine for transportation from the strip pit to the tipple.

Mine Car Haulage to Tipple

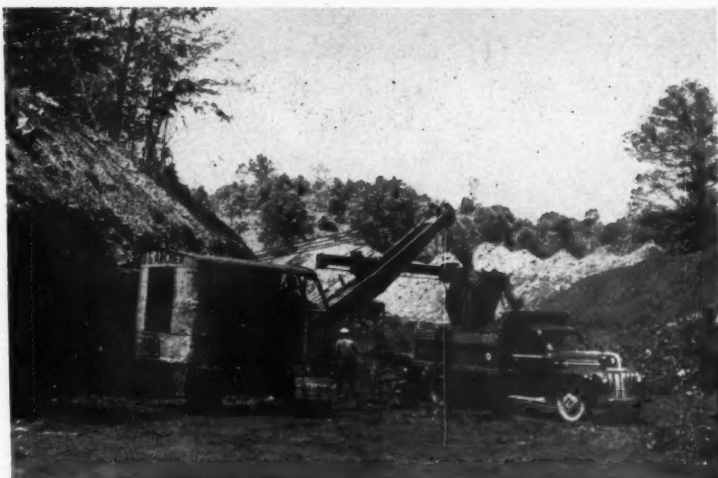
As shown on the mine map the main heading of the Norton mine crosses under Kittle Run, with a cover of about 18 ft. This is a local dip or sinclinal, the coal rising again both east and west until it again shows in creek bed about 400 ft. on either side of the headings. The operating management conceived the rather original idea of sinking a shaft 4 ft. in diameter at this location, to the underground main headings; a bin with a capacity of 700 tons was built directly over this opening, and at the bottom of this bin the coal is loaded in mine cars, controlled by suitable arrangements at point of loading. From there it is transported to tipple and given the same careful sizing and preparation as the deep mined coal, thereby assuring a quality of strip coal equal in all respects to the regular standard product.

In order not to interfere with the regular haulage system of the mine, a special side track off the main line was constructed for the bin and in addition this coal is handled at night. Removal from the bin begins about 4 o'clock in the afternoon and, by an arrangement of the working hours the outside trucks deliver additional coal into the bin while it is being taken out below. As much as 1,300 tons have been handled in one shift by this combination of facilities, but the normal production is about 800 tons per day.

On the surface a plot of ground contiguous to the top of the loading shaft has been leveled which allows for storage and as much as 5,000 tons have been stored at one time. This is of great advantage in case of delays or other interruptions that might interfere with orderly operation. The coal is moved to the bin from storage by a bulldozer, with a minimum of breakage.

Stripping Operation

Outside of the fact that the coal lies in a stream bed, there is nothing of special or unusual interest in the open pit operation. The maximum cover to be removed is 35 ft., the top



A 3/4-yd. shovel loads coal into 5-yd. trucks



Trucks discharge at top of shaft bin

soil is taken by a 3/4-yd. dragline, the underlying heavy material is handled by 2 1/2-yd. shovels and the coal is loaded by a 3/4-yd. shovel—all this equipment is gasoline or diesel powered. Five trucks of 5-yd. capacity—one held as a spare—are used; the seam has a slate bottom which makes a good natural road and, depending upon the length of haul, 3 or 4 trucks have been able to deliver loads to the bin at the rate of one every 2 1/2 minutes. The open pit workings are in charge of J. P. Wilkinson, who has had a wide experience in Illinois and Indiana strip mining.

Drilling and Shooting

As yet there has been no need of drilling in the overburden; this depth has varied from 2 ft. to 10 ft. and the material has been removed with draglines and shovels. The coal is shot by drilling vertical holes about 6 ft. apart depending upon thickness and nature of coal; gelatine explosive is used and generally six shots are fired at a time. This shatters the bone strata immediately over the coal and it is entirely cleaned off before the coal is loaded—most of it is removed with a bulldozer but a small amount of hand picking completes the job.

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The regrinding plant at Lake Linden is representative of the magnitude of equipment installations necessary in the recovery of copper values

Stockpiling—As Applied To Copper

We must not fail—as we did following World War I, to make adequate provision for our military security

By W. W. LYNCH

New York Representative
Calumet & Hecla Consolidated Copper Co.

COPPER is one of the most essential of the materials used in war. It is the chief metal component of cartridge and shell cases. It is required in large quantities in the construction of battleships, transports, tanks, trucks, jeeps, planes and the many other machines of modern war. It is indispensable in battlefield communication lines. In short, a nation without adequate supplies of copper is without adequate arms to combat an enemy so equipped.

The general magnitude and mechanized nature of the present war has resulted in an unprecedented amount of copper being mined and manufactured for war purposes. For approxi-

mately 4 years the copper mines of the world have been pouring forth copper into war usage at a record rate of production. Old mines in the United States have been reopened at governmental instigation to supply our armed forces with their requirements. Ore bodies too low grade to be economic in peace times have been brought into production with financial assistance of the Government, simply because copper in tremendous quantities is needed to win the war.

Figures of pounds or tons involved mean little to the layman. To those having a knowledge of the copper industry, however, the fact that during the past four years some 12,000,000

tons, or 24,000,000,000 lb. of copper metal have been produced in the world and have gone into munitions presents a staggering picture. They know full well that except for the relatively small amount which has gone to the bottom of the ocean, very little of it will have been "destroyed" or lost. Most of it, in fact, will be salvaged, remelted and made available for new usage, as was the case after the first World War. The difference between the situation in this war, as against World War I, is in the immensity of the quantities involved.

A Copper Deluge Must Be Avoided

It is impossible to measure with exactness what the effect would be if no control is placed on the flood of war-born copper that otherwise will deluge the market in the transition from war to peace. Some measure of this effect may be gained from experience of World War I, after the close of which virtually every copper mine in the United States was closed for a period of one year, with accompany-

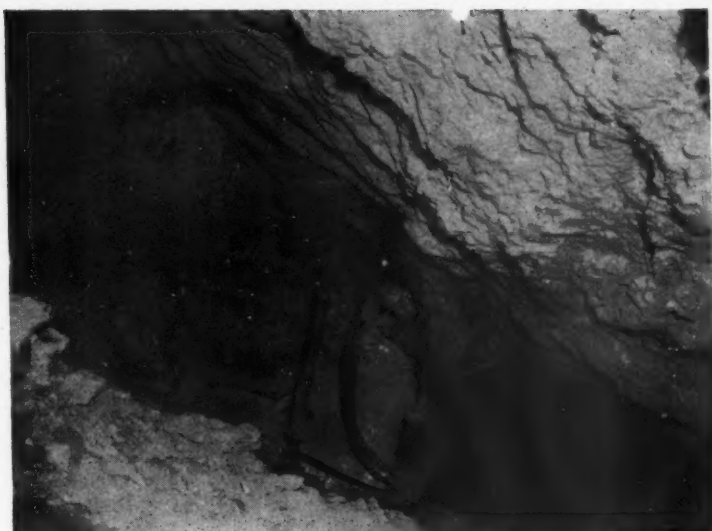
ing unemployment and distress in the copper mining communities. It seems logical to conclude that even more serious consequences are in store for the copper mining districts if a laissez faire policy is followed in respect to the surpluses of the present war. Some of the ablest judges of the industry estimate that these surpluses will amount to a three-year supply of peacetime needs.

It may be argued in some quarters that damage to the industry through an over-abundance of copper would be offset by the benefits accruing to the consumer from low prices. Certainly the consumer would temporarily get his copper at bargain-counter prices if the war surpluses are permitted to flood the market.

Meanwhile, however, as experience following the last war indicates and as otherwise seems certain, there would be no work for the copper miners. A long shut-down of the mines brings destitution to the mining communities; many mines cave or flood, or both, with the result that much ore is rendered unmineable—a complete loss and waste of a valuable natural resource. Herein lies the fallacy of the theory that an over-abundance of copper metal, however large, can do no harm. It not only can be ruinous to the mining districts, but eventually the consumer must also suffer the loss of the ruined ore bodies. A deliberate wastage of natural mineral resources means loss to both producer and consumer; it is a loss to the nation as a whole.

Let's Not Take Chances Again

It has been widely urged that a Government stockpile of copper, as well as of other essential war materials be created to serve the double purpose of avoiding economic distress in the mining districts and of placing the nation in a position of prepared-



Stoping operations such as this one on the Kearsarge lode are carried on at great depths and demand the best mining skill for recovery

ness to meet any future military emergency. Whatever weakness, if any, can be found in this proposal from a purely economic viewpoint, the bitter truth of our unpreparedness at the beginning of this war is, regardless of any other consideration, ample reason why it should be carried out. The plain, undeniable truth is that this country took dangerous chances after World War I in failing to maintain adequate stocks of essential metals and minerals. A second failure of this nature would be nothing short of stupidity. We have apparently "come through" finally with sufficient copper, zinc, lead, manganese, chrome, tungsten, etc., to meet our requirements for this war, but our having done so has been a matter of good fortune rather than foresight.

Congress has presently under consideration the matter of determining a definite policy and formula covering disposal of surplus Government property, including materials. Certainly the definition of the term "surplus," in this connection, involves a determination of the nation's requirements for preparedness to meet any future emergency. Preparedness calls for the creation and maintenance of adequate stockpiles of essential war materials. It seems to follow logically, therefore, that the necessary legislation that must soon be decided to handle the problem of disposal of war surpluses cannot be separated from legislation covering stockpiling. The adequacy of the stockpiles will, to a large extent, be a measure of the nation's future safety.

PAIMEG

MEMBERS of any mineral industries society in the United States and Canada are eligible to join the National Section of the Pan American Institute of Mining Engineering and Geology. Individuals paying 1944 dues, amounting to \$5 (no initiation fee), before December 31, 1944, will be recorded as charter members. At this stage membership must be based on willingness to aid in fostering good will and better understanding among mineral industries engineers and technologists in the Western Hemisphere. Anyone interested in joining PAIMEG is requested to forward dues to Edward Steidle, chairman, National Di-

rectorate, PAIMEG, State College, Pa., or to Arthur T. Ward, secretary-treasurer, National Directorate, PAIMEG, 50 Church Street, New York City. Minutes of the organization meeting will be forwarded to all members.

PAIMEG desires to cooperate with all the mineral industries societies of the Americas, support all activities that will benefit the mineral industries, and expand fundamental knowledge of geological conditions and encourage the standardization of technical terminology. The Institute will also facilitate the interchange of publications, students, professional men, and industrialists connected with the mineral industries.

An annual meeting of the members

of PAIMEG will be held in conjunction with that of the February meeting of A. I. M. M. E. in New York and a program of papers will be presented on mining, metallurgical and geological subjects in Latin American countries.

PAIMEG is proposed as an autonomous private institution, independent of the governments of the Americas. Qualified candidates from commercial organizations, societies, universities, etc., which are closely related to the mineral industries are accepted as members. PAIMEG wishes to organize through the initiative of individuals and private interests without having the necessity, for the time being, of asking help of the governments concerned.



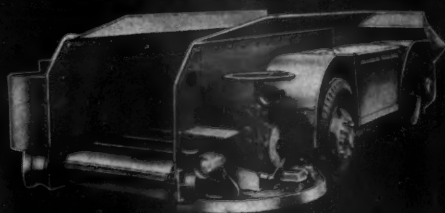
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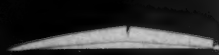
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DEEP DRILLING

FOR IRON ORE ON THE MARQUETTE RANGE

IN ITS search for iron ore bodies located at considerable depth, the Cleveland-Cliffs Iron Company is employing four large oil-well type steel derricks.

If a diamond drill hole is to be put down much over 1,500 ft., the large rigs are used in preference to the usual spruce-pole tripods. Of the four derricks in use, three are 65 ft. and one 70 ft. high. These rigs are the only ones of this type used in the Lake Superior region although other deep-ore districts employ similar equipment. Among the ore bodies proved up by these drills is that of the new Mather iron mine at Ishpeming, Mich. Here a diamond drilling campaign of

many months, following extensive geological investigations, determined a deep ore body.

The Cleveland-Cliffs Iron Company is now well equipped to carry on its deep drilling explorations.

The derricks are designed for quick moves with all parts numbered for easy matching during erection. The erection crew usually requires about three days to complete a set-up or to dismantle. These large steel derricks have the advantage of great strength and rigidity and permit pulling 50 ft. of rod at a time. Tripod rigs permit only 30-ft. pulls.

The base of the derrick is bolted to 12-in. x 12-in. sills laid on levelled ground; stability is ordinarily obtained by use of four guy wires. To date no trouble has been experienced due to high winds, but when the set-up is on a topographic prominence, eight wires are used. Guy wires act as grounds but an additional wire to a pipe-ground is provided. Occasionally the runners feel a discharge on cloudy days or during rainstorms—the phenomena is variable, depending on the individual. During electrical storms the crew may retire to shelter. Rod handlers equipped with safety belts work on the regular platforms provided—one near the derrick top, one just above the shanty.

The drills are steam powered and are designed to drill to about 4,000 feet. B X size equipment is used which recovers a 1½-in. diameter core.



BEHIND A STOP WATCH

Time studies prove invaluable aids to increased efficiency in all mechanical operations

As a diagnostician of present-day mine mechanization programs, I have made notes of some of the peculiar conditions or practices existing at some mines which seriously hamper the attainment of satisfactory production efficiency from the mechanical loaders. This particular article will deal entirely with the shaker-duckbill system of mining and some of its attendant ills.

The essence of this particular mine mechanization system is an overlapping cycle of face operations wherein all the productive work as well as the service work is done simultaneously in a single working place. These operations: productive, cutting, drilling, bugdusting, shooting and loading; service, timbering, pan extension, etc., must all be planned just as carefully as in any other system of mechanized mining. Why does one mine get a face efficiency of 37 tons per face man while another mine with equal, or in some cases even better physical condition, gets about one-third, sometimes only one-fourth of this amount. This discrepancy can be easily determined through the medium of accurate engineering time studies and job analysis. Expert use of the stop watch and its findings will determine why one mine produces coal at the face 50 to 60 percent cheaper than a similarly situated mine having practically the same natural conditions.

The Job Demands Trained Personnel

While the time study observation itself is apparently a simple operation, this apparent simplicity causes many companies to assign the job to anyone who is handy at the time. The selected person does his best and eventually hands in a conglomeration of figures unintelligible either to himself or the general manager who carefully "files" away the figures for future reference. And the face inefficiency goes on.

Time studies and job analysis is a specialized engineering operation requiring a high degree of skill in doing the work and thorough familiarity with all mining operations. Furthermore the analysis and later the synthesis of the work must be done very carefully so that proper conclusions are obtained and any production retarding factors eliminated.

During the particular study where

the output averaged 10 to 12 tons per shift it was found that the miners worked steadily throughout the shift. In fact, visual observations and analysis of the study disclosed the fact that these men actually worked harder than the men who threw 37 tons per face man. We find these interesting facts, however:

(1) The duckbill was not operated in a manner to keep the pan-line full when the loading phase of the cycle was in progress. It must be realized that the pan-line capacity is the limiting factor in this type of mining and must be kept heaping full at all times for maximum efficiency. This mine took 123 minutes to load out the 29 tons of coal in the fall. Actual loading rate was 14 tons per hour. When the operator watched his pan-line the loading perked up with no more effort on the workman's part.

(2) When a pan addition to the shaker conveyor was made, it required 28 minutes. This could have been done in 7 minutes. Ratchet wrenches were in broken condition. Threads on bolts were in poor condition. Lost time represented 10 tons of coal.

(3) Instead of a supply crew to keep an extra pan and ball frame inbye near the swivel, the face crew had to get their pans from the room neck. This lost 24 man minutes which should have represented 3 tons of coal.

(4) While the crew worked hard, they accomplished little and reflected the haphazard organization from above and the dilapidated condition of the equipment.

(5) Car supply caused a delay of 14 minutes loading out a fall. This was 11.4 percent and represented another 4 tons of coal.



By P. R. PAULICK
Consulting Mechanization Engineer
Library, Pa.



Failure to keep the pan-line filled will prolong the loading cycle and hold up cutting machine man and driller

(6) An electric cable which had given previous trouble due to blow up, gave trouble and was temporarily repaired (probably will not receive proper permanent repair and will give away again in a few days). Lost time 32 man minutes or 4 tons.

Thus, if items (2) to (6) had been given attention, the loading rate would increase from 14 to 25 tons an hour. With attention to item (1) the rate would go up to 27 to 30 tons an hour which accounts for the difference between mine No. 1 with 37 tons per man at the face and No. 2 mine with 12 tons per man at face.

How to Obtain Real Results

Here is a list of questions and suggestions for shaker-duckbill mines:

(1) For the General Manager or Superintendent.—Set up the taking of some detailed time studies. Every large efficient manufacturing plant time studies its operations and under war effort this tendency is producing excellent results by making work most productive with a minimum of physical effort and movement. Your mine in producing coal is just as much a manufacturer as a gun plant. You have a quantity production problem and your miners under mechanical loading repeat operation after operation. Make their work as well organized and as easy as possible. It pays both the boss and the miner. You are not generally trying to get more labor out of them, but more production for less physical effort. This is the keynote.

These time studies should be taken for an entire shift on each crew. Show how every minute is used and what every man is doing every minute. These can be broken down to show the time for each phase of the



A high degree of face efficiency is only obtainable through careful planning and analyses of delays

cycle. See that your bosses down to the section bosses receive copies. Analyze your results to see if you and your organization and not the miners are to blame if your results are poor. After you get in the groove on efficient operation, you may only have to time study again if the daily reports coming to your desk show some falling off. Time study and find out the real cause. If in doubt as to whether your various operations are efficient, consult the manufacturer.

(2) For the Mine Boss.—Keep a close eye on those car delays.—Derailments.—Material supply. Spend some time on your copy of time study.—

You will find some lost man minutes and inefficiency directly attributable to yourself.

(3) For the Section Boss.—See that material in proper quantities is regularly received and delivered in places for convenient use by your men.—Put some thought on a system to get this done.

Pans should be stowed systematically and if you have a supply crew get spare pans and ball frames at the swivel point with proper regularity and not hit or miss. If you use the auxiliary pan-line system whereby the loose pans are coupled and dragged up by the cutting machine rope so that when you use a spare pan at the face you add another at the room neck, work out a cycle and train your supply crew. Same applies to pit posts, bars, bits, etc.

The best section bosses I have seen can handle a duckbill with the best of them. Watch for poor adjustment on the ratchet. This kills your tonnage. Keep an eye out for broken ratchet wrenches, poor threads on bolts. Run your section in ship-shape manner. Don't let that temporary cable repair go for long. Know as much or more about correctly setting up a drive as any of your men. The same applies to the pendulum jack. There is a right and wrong way to do these things. The wrong way will rob you of tonnage with greatest regularity and will cause your crew untold delays and sometimes ruin the equipment.

Don't Neglect the Details

Men are shifting fast these days. Show your men and help them. If they still don't get it, show them



Full knowledge of conveyor-handling techniques is needed by both bosses and crews

again. Today you have timbermen operating cutting machines, running loaders, drilling and doing work they may have aspired to, but never had the chance. If you don't have the know-how yourself or have become rusty, brush up. You are where you are, to lead and help your men. Study your crews and get them to do the cycle with the least moving about, fuss and physical effort.

The best duckbill crews do little hand-shoveling at the machine. A duckbill can load at the rate of 90 tons an hour. A good man hand shovelling does well to hit 8 tons and not for an hour. Don't let your inexperienced crews try to compete with the duckbill by hand shovelling. They simply retard the loading rate and wear themselves out. Hand shovelling is for fly coal, spillage and clean-up.

Teach your face crews cooperation. Any mechanical loading job is teamwork and the best of them have the teamwork which is drilled into our boys on the flying fortress. You have lost many of your well-trained ratchet men and cutting machine men. The new men require help and training. They hate to admit they don't know all about it, but results in decreasing tonnage per unit in the last year tell the story.

Familiarize yourself with your copy of the time studies. They are going to show your strong and weak points and enable you to put your finger smack on them.

(4) For the Duckbill Crew. These are the boys who are right on the firing line. Of the five items which were listed as taken from an actual time study and which lowered pro-



Every phase of the operation must attain the greatest possible effectiveness

duction, only item one can be charged to the crew. This was failure to keep pan-line filled, thus prolonging the period of loading cycle and holding up the cutting machine man and driller. Training quickly corrected this weakness.

More and more cutters, loaders and equipment are going into our mines to get out coal for the war effort. You men at the face can help that boy at the front by taking the best care possible of your own gut which is your cutter, drill or duckbill. Don't let trouble go unreported. A miner gets the feel of his equipment and senses

trouble often before it makes a major breakdown. Now more than ever, we are going to have to take care of the little things so that the big things don't get a chance to break down.

If it is your job to keep pan-line bolts tight, do it. One mine I recently visited bought several hundred spare bolts a couple of years ago. They only used a few. The men at the face keep their pans tight.

If we all pull together, from top boss down, you will find your work easier and get out the most coal for the least effort—isn't this what every real American Miner wants to do?

Dredging

(Continued from page 24)

inundations can take place, no matter how high the water may rise during flood periods.

Results are Good

The following figures may be of interest as to the amount of gravel moved and placed in the north and south levees: Total amount was 2,972,600 yds.; in the section from the lower end of the city levee to the bar, an additional 881,879 yds. was moved, up to date, in construction of this lower levee and removal of the bar. On the north bank, on the 17-acre tract, where we were compelled to work in the winters of 1940 and 1941 until we got the permanent streamway of the river adjusted under perfect control in the

center of the river bed, we moved 1,762,808 yds., or a grand total of 5,617,287 yds. since the inception of the operation.

In ordinary digging, this dredge has a capacity of about 5,000 yds. a day. Of course, there was much lost time in climbing in and out of the river and sometimes time was lost at the period of high water.

Our preliminary prospecting showed an average of 25 cents a cubic yard in gold. In actual operation, the average of the entire deposit removed was 26¢ cents per cubic yard.

From its inception, the work has been in charge of the very capable management of Harold Kumle, an experienced operator of both bucket-line and dragline plants, who is superintendent of all operations. Under him, S. J. Norris, Jr., has been an efficient

surveyor and civil engineer. A. B. Johnson is in charge of the shops and the mechanical care of the equipment. It is a noteworthy fact that dredging men like to stay with their own industry, with which they are thoroughly familiar, and consequently the company has had no difficulty in maintaining an efficient crew throughout the entire operation.





The washing plant is located at the site of the Judge well which produces water sufficient for a 300-yd. capacity.

Placer Scheelite

An account of the problems involved in mining low grade scheelite gravel, transporting it five miles and beneficiating it at a profit

By A. F. MUTER

Manager
Atolia Tung-Sun Placer Mining Co.

PRODUCTION of Tungsten from the alluvial gravels of Baltic Gulch in the Randsburg Mining District of California was undertaken by the Atolia Tung-Sun Placer Mining Co., a limited partnership, in May, 1942, but due to priority delays and inability to find the proper equipment, actual work was not started until May, 1943.

Tungsten occurs in Baltic Gulch in the form of scheelite, the calcium tungstate, which because of its high specific gravity and its ability to resist erosion, is often found in placers. Since the scheelite on this property is found in coarse, slightly rounded fragments and large angular pieces as well as finely divided grains, its occurrence is in a residual placer, i.e., the alluvial material was not laid down in a running stream but was washed down the sloping sides and into the gulch from near-by sources by intermittent flows of water from storms of short duration. For this reason the scheelite is fairly evenly distributed throughout the alluvial detritus both in the channel and on the slopes leading into it, with the exception of a foot of soil on the surface. However, there have been places in the gulch favorable to reconcentration, where thousands of pounds of scheelite were produced by individ-

uals at the rate of \$100 a day per man during the First World War.

Stringer District Produces Best Scheelite Ore

The source of the scheelite was the erosion of the stringer veins that occur in the schist of the surrounding area cut by Baltic Gulch, which is known locally as the Stringer District. It is stated by local authorities that this district had a production of at least \$4,000,000 worth of scheelite in World War I.

The scheelite found in this area is the purest found in the district and the concentrate is practically free from all deleterious minerals and is in such demand in the manufacture of metallic tungsten that it carries a premium above the regular price. It is found in lumps of considerable size down to impalpable powder. However, most of it has body enough to be saved by gravity concentration. After the present plant was finished, a test run on approximately 1,000 yards showed that 9 percent of the scheelite saved was taken from the picking belt in sizes from $\frac{3}{4}$ in. to $1\frac{1}{2}$ in., although a few "spuds" up to $2\frac{1}{2}$ lb. were found; 19 percent was taken from the jig in sizes from $\frac{3}{16}$ in.

to minus $\frac{3}{4}$ in.; and 72 percent was taken from the concentrating table, all minus $\frac{3}{16}$ in. but most of which was very fine.

The minerals of tungsten have always been extracted from their ores or gravels by very simple methods and although the concentrate in most cases was of sufficiently high grade to be marketable, the percentage of recovery was always low. Even at the present time, a Government report says that its investigation shows a recovery on the average, of only 55 percent.

In the early days in the Randsburg District, nuggets of scheelite, locally called "Spuds" were recovered in the "Spud Patch" and similar areas by digging the gravels with close-tines garden forks, leaving the fines in the gravel to be recovered by more refined methods. As there was always a scarcity of water in the district, most of the attempts to save the fines were by dry methods and every contraption that could be conceived by the brain of man has been used for this purpose.

Before undertaking to work the gravel in Baltic Gulch, the history of methods that had been used was studied: the gravel was carefully sampled and tested; the plants in operation in the district were studied; and sources of water were investigated, since, up to date, no dry method of recovery on a large scale has been successful. Having found that the Judge Well, located on the northeast quarter of section 21, about $2\frac{1}{2}$ miles west of Randsburg, was a source of sufficient water to operate a 300-yd. plant, it was bought by the partnership, and as the power line of the California Electric Power Company was only 1,600 ft. distant, it was decided to build the washing plant at the well and haul the gravel to it—



a distance of 5 miles over improved roads with a down-hill pull.

The problem was to mine and haul a low-grade gravel, carrying less than 3 lb. of scheelite and 35 cents in gold per yard, a distance of 5 miles, and beneficiate it at a profit.

Much Special Machinery Called For

Since most of the scheelite was in very fine particles incased in a slimy material and stuck to the larger pieces of gravel, it was decided to use a trommel with a long scrubber section in which to wash the gravel and free the scheelite and gold and then save the fines which constituted the bulk of the scheelite on an 8-ft. x 30-ft. Overstrom concentrating table that was designed to handle 17 tons of minus $\frac{3}{16}$ -in. mesh material per hour. This super-table was selected because it seemed to be perfectly suited for the job. It has tremendous capacity; is nicely counterbalanced; can be adjusted and controlled without shutting down; the head-motion is especially strong and sturdy with all moving parts running in a bath of oil; it makes a high grade, clean concentrate and very clean tails; and its performance has equalled the manufacturer's guarantee.

Flow Sheet

The flow sheet as worked out finally is as follows:

The gravel is mined and loaded with a 1-yd. P & H power shovel, and hauled to the washing plant by truck. When possible the trucks dump directly into the receiving bin through an 8-ft. x 8-ft. grizzly, made up of 120 lb. steel rails set with 5-in. openings. If the bin is full, the gravel is stock-piled on the ramp and pushed in later with a bull-dozer.

The gravel is fed from the receiving bin by a reciprocating feeder onto a 30-in. conveyor belt, 100 ft. between centers, and elevated about 35 ft. to the mill bin.

From the mill bin, a steel-plate feeder feeds it into a 54-in. by 24-ft. trommel, with a 10-ft. scrubber sec-

tion; a 3-ft. section of 8 mesh wire screen, a 6-ft. section of $\frac{3}{16}$ -in. mesh wire screen, and a 3-ft. section of $\frac{1}{4}$ in. punched screen.

The 10-ft. section does a thoroughly good job of scrubbing and all the minus 8 mesh material, which contains most of the gold, scheelite and slime, goes to an 8-ft. desliming cone. The slime overflow, which contains some scheelite, too fine to save by gravity concentration, goes to the table-tailings launder, where, because of its high specific gravity, it helps to carry away the 16 tons per hour of table tails, the disposal of which from a 30-ft. table on a flat mill site was a difficult problem. The underflow from the cone goes to a 2-ft. Knutsen bowl, which is made of aluminum with a rubber lining on which is molded the riffing against which the gold and some fine scheelite are held by centrifugal force. The bowl revolves at 120 r.p.m. and recovers practically all of the fine gold. The bowl discharges directly onto the Overstrom table at a point about 3 ft. from the head end.

Gold Recovery

The accumulations of gold and scheelite behind the riffles of the bowl are washed out daily and once a month put back into the bowl with mercury, the bowl run with clear water, and the gold amalgamated. The amalgam is retorted and the sponge gold shipped

to the United States mint. The gold recovery to date has been about 30 cents a yard.

The material through the $\frac{3}{16}$ -in. mesh screen goes through a trap and a riffled launder where the coarse gold is caught and thence to the head end of the table. The ability of the table to handle from 15 to 17 tons of minus $\frac{3}{16}$ -in. material with a very small percentage of loss is due, in some measure, to the sizing and the distribution of the different sizes as stated above. The riffles on the head end are 1 in. high which is something over five times the diameter of the largest particles in the feed. Practically all the scheelite and black sand come off the table on the first three riffles. This concentrate is cleaned up each day by passing it through a two-stage drier and over a magnetic separator which takes out the iron. It then passes over a dry concentrator that takes out any gold that has escaped the bowl. Most of this gold is so fine that it floats on water. The scheelite concentrate from the table has run consistently above 74 percent WO_3 .

The middlings that come off the next three riffles, containing less than 4 lb. of scheelite per ton, are put back over the table for re-concentration.

Jig Operation

The gravel that passes through the $\frac{3}{4}$ -in. screen goes to a two-compartment Denver Equipment Company mineral jig, each compartment 16-in. x 24-in., which makes a very clean, high grade product on the bed. Only fine material broken up in transit goes into the hutches and this material is passed onto the table. The tails from the jig go to a flight conveyor that elevates them sufficiently to drop them into the Stephens-Adamson desander which also receives the tails from the table. From the desander the tails go on the stacker belt and the overflow goes to the first settling pond where the slimes settle out and the nearly clear water overflows to the pond behind the second dam from

(Continued on page 45)



The gravel is mined by power-shovel and hauled to plant by truck



Coal Division Reports

Trends In Coal Mine Power Costs

THE use of electrical power has become one of the most important phases of coal mining and in the same manner that mechanization has followed different lines of development to suit varying conditions, the methods of converting, distributing and using electricity have also varied. Naturally, some companies have developed high efficiencies in their power utilization with corresponding favorable costs, while others have not made such progress and a comparison of individual installations and results would of course be of great value. However, as a substitute for direct comparisons, we are presenting in this article a compilation of power data from a group of more than 150 coal mines in the Appalachian field; these figures are based on yearly surveys made by the West Virginia Engineering Company, Charleston, W. Va., who for the past several years have furnished copies of their annual statistical analyses to the members of our coal division.*

On the following page is a tabulation of the averages over the past eight years showing some of the pertinent figures presented in these surveys. This has been prepared to give a brief summary of the trend in power use and costs that have applied to these particular mines and while these companies include only a small percentage of all the operations in the United States, it is probable that their practices represent a fairly accurate cross section for bituminous mining as a whole.

Statistics covering a large group of mines showing how the use of electric power has increased during past eight years

By G. B. SOUTHWARD

Mechanization Engineer
American Mining Congress

The table is self-explanatory and it is not the intent of this article to attempt a complete and detailed discussion of the various factors indicated by these figures; in most cases the trends are clearly brought out in the tabulation. However, it may be in order to mention one or two of the more important points which the figures reveal.

increase in the power used by each of these groups. This of course is further reflected by the K.W.H. per ton given in Column 8, and the accompanying chart illustrates the course that this trend has followed. For simplification, only the three large tonnage classifications are plotted but curves for the two lower classes would about coincide with that of the 20,000-

AVERAGES OF POWER CONSUMPTION AND COSTS

Monthly Production	Monthly kw.h. purchased		Kw.h. per ton		Power cost per ton	
	1936	1943	1936	1943	1936	1943
5,000 to 10,000 tons.....	42,927	46,679	5.42c	6.26c	11.2c	10.0c
10,000 to 20,000 tons.....	74,674	88,799	5.22c	5.89c	9.4c	9.2c
20,000 to 30,000 tons.....	128,514	144,159	5.20c	5.89c	8.5c	8.4c
30,000 to 60,000 tons.....	168,634	226,363	4.62c	5.90c	7.1c	8.2c
Plus 60,000 tons.....	306,966	485,859	4.05c	6.04c	5.8c	7.3c

Power Consumption

It will be noted in Column 3 that while there have been some fluctuations, the average tonnages for the various groups have remained at a fairly constant level, but as shown in Column 5 there has been a marked

30,000 ton graph. It is of special interest to note that by 1943 all group averages had arrived, by different paths, at the approximate level of 6 K.W.H. per ton of coal.

The causes for the irregularities in these curves, particularly that of the plus 60,000 ton mines are not quite clear, but the following explanation seems reasonable and is offered for what it may be worth. Briefly the explanation is that in the past when a coal mine first installed loading machinery, the question of providing adequate power was seldom given its proper consideration. When this happened, power losses were naturally heavy and in many cases were not corrected until their effect on production became glaringly apparent. The curves, especially that of the plus 60,000 ton group seems to support this.

* NOTE: Copies of the 1943 and also the 1942 Annual Survey Sheets, will be furnished on request to the American Mining Congress.

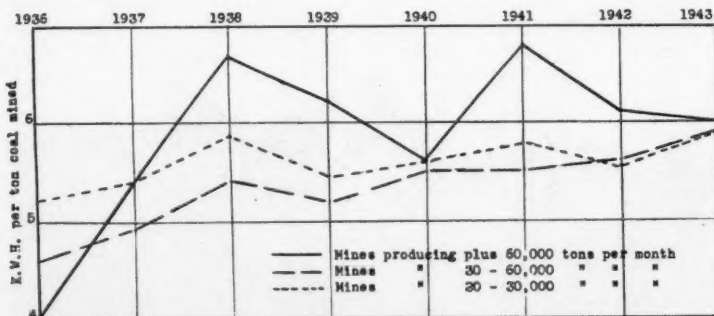


Chart showing average k.w.h. per ton

Table I

ANALYSIS OF POWER COSTS OF COAL MINES—AVERAGES FOR EIGHT YEARS, 1936 TO 1943

Compiled from Annual Statistical Surveys of the West Virginia Engineering Company
Covering Mines in the Southern Appalachian Field

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Number of Coal Companies	Average Monthly Tonnage	Substation Capacity K.W.	Average Monthly K.W.H. Purchased	Average Monthly Power Charge	Average Total Cost Per K.W.H.	K.W.H. Per Ton Coal	Power Cost Per Ton Coal	Tons Coal Per Total A.C. H.P. Connected
MONTHLY TONNAGE CLASS—5,000 To 10,000 TONS									
1936	33	7,799	183.33	42,297	\$872.88	\$.0206	5.423	\$.1119	19.42
1937	28	7,544	186.92	40,575	814.18	.0201	5.379	.1079	19.16
1938	35	7,459	190.88	43,003	858.33	.0200	5.765	.1151	17.41
1939	39	7,587	210.92	44,896	828.96	.0185	5.920	.1093	17.17
1940	30	8,391	219.48	53,166	940.37	.0177	6.340	.1121	17.63
1941	19	7,328	207.89	44,878	789.23	.0176	6.12	.1077	17.97
1942	17	7,485	187.50	43,469	797.36	.0183	5.81	.1065	19.02
1943	26	7,453	186.54	46,679	741.45	.0159	6.26	.0995	19.94
MONTHLY TONNAGE CLASS—10,000 To 20,000 TONS									
1936	40	14,314	298.75	74,674	1,350.57	.0181	5.217	.0944	25.44
1937	45	14,474	310.72	78,446	1,364.75	.0174	5.420	.0943	22.82
1938	49	14,695	393.87	92,659	1,579.85	.0171	6.305	.1075	18.67
1939	48	13,760	347.92	80,880	1,358.02	.0168	5.880	.0987	20.55
1940	41	14,433	325.00	79,136	1,352.66	.0171	5.480	.0937	22.30
1941	50	14,955	309.18	79,331	1,240.69	.0156	5.30	.0830	23.74
1942	44	15,374	326.79	94,307	1,447.88	.0154	6.13	.0942	25.15
1943	48	15,067	333.70	88,799	1,390.24	.0157	5.89	.0923	25.12
MONTHLY TONNAGE CLASS—20,000 To 30,000 TONS									
1936	34	24,706	443.38	128,514	2,094.45	.0163	5.202	.0848	24.30
1937	27	24,954	463.89	135,164	2,096.32	.0155	5.417	.0840	26.11
1938	30	23,870	527.73	139,917	2,208.29	.0158	5.861	.0925	20.41
1939	28	24,565	479.64	134,134	1,963.51	.0146	5.460	.0799	23.03
1940	33	24,946	475.16	140,145	2,044.37	.0146	5.618	.0819	24.02
1941	27	24,945	494.23	144,863	2,043.28	.0141	5.81	.0819	23.48
1942	35	23,915	448.48	132,718	1,965.54	.0148	5.55	.0822	23.89
1943	32	24,465	461.29	144,159	2,063.51	.0143	5.89	.0843	23.98
MONTHLY TONNAGE CLASS—30,000 To 60,000 TONS									
1936	26	39,339	607.69	168,634	2,789.04	.0154	4.617	.0709	30.61
1937	32	39,607	660.94	196,477	2,861.18	.0146	4.961	.0722	28.09
1938	17	36,857	715.62	200,695	2,914.09	.0145	5.445	.0791	22.46
1939	26	40,231	769.20	210,402	2,973.92	.0141	5.230	.0739	22.93
1940	26	42,340	731.81	234,603	3,218.38	.0137	5.540	.0760	25.67
1941	27	42,130	736.11	232,853	3,109.32	.0134	5.53	.0738	24.17
1942	39	41,151	717.76	233,560	3,149.19	.0135	5.68	.0765	24.78
1943	30	38,373	685.34	226,363	3,159.40	.0140	5.90	.0823	24.02
MONTHLY TONNAGE CLASS—OVER 60,000 TONS									
1936	5	75,801	1,120.00	306,966	4,410.54	.0144	4.050	.0582	38.11
1937	5	90,546	1,277.00	489,048	5,854.44	.0120	5.401	.0647	36.54
1938	5	88,282	1,382.00	594,076	6,827.59	.0115	6.729	.0773	32.77
1939	5	86,825	1,070.00	541,730	5,966.68	.0110	6.240	.0687	39.24
1940	12	90,090	1,416.67	512,358	5,977.47	.0117	5.690	.0663	29.98
1941	11	86,017	1,411.82	592,332	6,583.39	.0111	6.89	.0765	26.65
1942	11	74,649	1,170.91	459,215	5,450.01	.0119	6.15	.0730	29.87
1943	14	80,440	1,250.00	485,859	5,870.17	.0121	6.04	.0730	29.95

The years 1936 to 1938 marked a great expansion of mechanization, with mobile loaders and conveyors being installed in mines that had never used them before and it can be safely assumed that in many of these operations, the power consumption was out of line until later when corrective measures were put into effect. History repeated in 1940 to 1942.

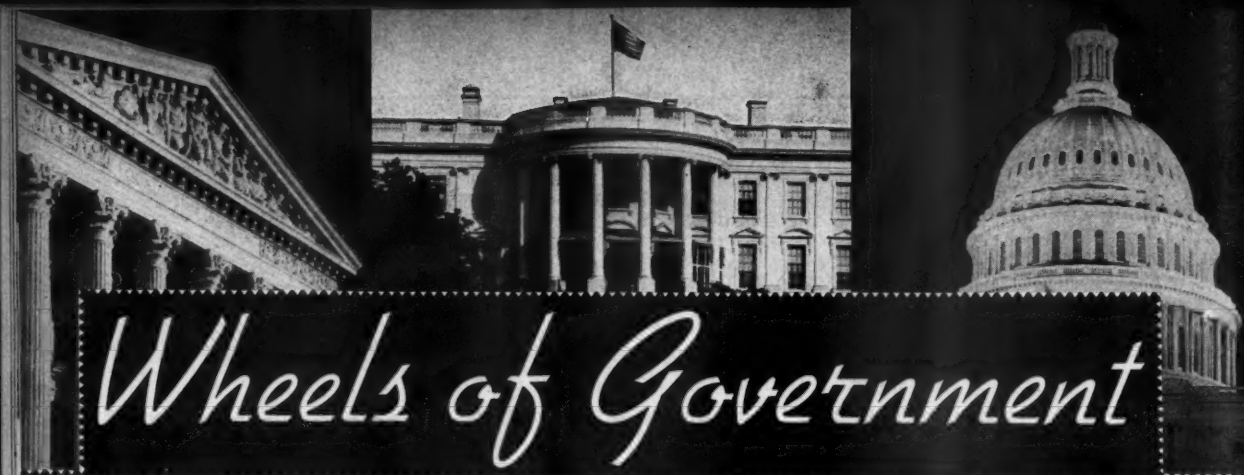
Power Costs

Another point for attention is the power cost per ton of coal in Column 9. Comparing these figures with those

of Column 8, it will be seen in the tabulation on the preceding page that in the mines producing up to 30,000 tons per month, the cost per ton has remained nearly constant while in the larger producers the cost has increased somewhat but not in proportion to the increased power used.

In commenting on this trend, Mr. H. P. Musser, in an article in a recent issue of the *West Virginia Engineer*, says: "This is brought about by many factors, such as reduced rates for the sale of electricity, more efficient utilization by maximum demand limita-

tion, power factor correction, load factor betterment, less conversion from alternating to direct current, higher voltage transmission, more efficient equipment, etc. Able technicians have reduced the cost of generating electricity. Engineers, watching and analyzing power utilization and insisting on better methods of use and more efficient equipment, have been largely responsible for holding power costs per ton of coal mined to a practically unvarying level, even though 50 per cent more power is used now than was used 25 years ago."



Wheels of Government

As Viewed by A. W. Dickinson of the American Mining Congress

RECONVENING on Tuesday, August 1 with a large number of the members still absent from Washington, Congressional leaders and the committees immediately concerned with demobilization legislation hastened to secure action urged by Bernard Baruch and Administration officials. Successes of United Nations' arms particularly in the European theatre of the war are regarded as calling insistently for the "human demobilization" laws which it is hoped will be the means of an orderly transition from war to a peacetime economy.

Surplus Property Disposal

It is apparently well understood between OWM Director James F. Byrnes and the congressional leaders that there is to be a separate surplus property disposal bill. Such a measure has for some weeks been under consideration in Senator James Murray's Military Affairs Subcommittee and Tennessee Senator Tom Stewart late in July issued a report on the subject from his Surplus Property Disposal Subcommittee of the Senate Small Business Committee. Estimating that Government-owned war-end surpluses will total \$103,823,000,000 as compared with \$6,000,000,000 at the end of World War I, the report discusses the various angles of surplus disposal and goes into the problem of mineral stockpiling.

Quoting directly, the statement is made that "in no field is the danger of dumping more real or pervasive than in metals and minerals, including both the primary and secondary forms. In metals and minerals competition between Government-owned surpluses and new commercial production is direct and unmitigated. . . .

"The problem is aggravated by the existence of huge stores of scrap metal which, like the stock piles of primary metals, must be considered in estimating the Government surplus which is in potential competition with

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Washington Highlights

CONGRESS: Reconvened August 1.
DEMobilIZATION: Congressional leaders spur action on demobilization bills.
SURPLUS DISPOSAL: Senator Tom Stewart's Small Business subcommittee reports.
CIVILIAN PRODUCTION: First halting steps toward resumption.
STABILIZATION FUND: Approved by 44 Nations' conference.
STEEL WAGES: WLB panel will present facts to full Board.
MINERAL STATISTICS: Commerce Department would duplicate work of mines bureau.
U. S. BUREAU OF MINES: Gets streamlined reorganization.
WPB: Philip D. Wilson now Vice-Chairman for Metals and Minerals.

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new commercial production. . . . Spurred by consideration of these huge metal surpluses and mindful of Pearl Harbor which saw this country dangerously short of its war requirements for certain strategic metals, the mining industry has come forward with proposals for legislation designed to create vast stock piles of metals and minerals against the requirements of a future war. . . . The most conservative of these proposals would have the effect of withholding from the commercial market all the Government-owned surpluses; others call for the increase of the stock piles." On the other hand, the report states, "A number of objections have been made to this approach. It is argued that some of the stock piles would be greater than military considerations would require and that the static stockpile theory smacks of the discredited Maginot line strategy of preparing to

fight the wars of the future with the weapons in the past"; others have suggested, "that the wise disposition of metal surpluses will involve the same balancing of considerations of market, Government cost, security, and national economic factors that is recommended for surpluses in general. After establishing stockpiles for security reasons in accordance with the recommendations of the military, the Administrator should, according to this view, work out with a mining industry advisory committee a program for the periodic sales of metal surpluses that will permit metal producers to gauge the market and continue fair production of new metal without interruption."

The tentative draft of a "Surplus Property Act" submitted by Surplus War Property Administrator Will Clayton and discussed in our July issue, has been introduced by Representative Colmer (Dem., Miss.) and referred to the Committee on Expenditures in the Executive Departments. Senator Ed Johnson of Colorado has introduced a somewhat modified form of the Clayton bill but congressional leaders have generally conceded that the Military Affairs Subcommittee, under Senator James Murray of Montana, is the proper medium, in view of its exhaustive studies on the subject, to bring forth the Surplus Property Disposal bill.

Civilian Production

When WPB Chairman Donald Nelson in June proposed a lifting of controls on the use of aluminum and magnesium in order to make a beginning on the resumption of civilian production, objection was made by Army and Navy officials, to the point where it was necessary for War Mobilization Director Byrnes to intervene. The final upshot was that aluminum and magnesium may now be substituted for other materials in end-products, manufacture of which is now approved, with the understand-

ing that there shall be no increase in the total production of such products. Manufacture of working models of post-war civilian products is authorized for experimental purposes insofar as it does not interfere with war or essential civilian production. Orders may also be placed for machine tools and equipment in preparation for later production. An order is expected in mid-August permitting "spot authorizations" by WPB field offices for production of articles now prohibited or restricted where facilities, manpower and materials are available and not needed for the war effort.

A compelling need for heavy trucks, truck tires, radar, artillery and ammunition has brought quick action on the part of War Mobilization Director Byrnes, who has given the War Manpower Commission the power of veto on proposals for new civilian production. Byrnes has added the use of sanctions which may include the denial of materials, fuel, power and transportation services to companies who do not comply with WMC orders to stop hiring additional men. Improved utilization of manpower is also being sought through the use of employment ceilings in labor shortage areas.

Monetary Stabilization Conference

Concluding the three weeks' conference at Bretton Woods, New Hampshire, delegates from the 44 participating nations approved plans for an International Monetary Fund fixed at \$8.8 and for a World Bank of Reconstruction and Development to operate with a capital of a similar amount. In managing the Fund each country has a minimum of 250 votes plus one additional vote for each \$100,000 of quota. Under this arrangement the United States has 27,750 votes (the total is 99,000), England 13,250, Russia 12,250, China 5,750, France 4,750, India 4,250, Canada, 3,250, Netherlands 3,000 with lesser voting power for the remainder of the 44 participating nations. Thus total votes for U. S., England, Russia, China and France equal 63,750; Latin America will total 9,645; and the remaining countries 25,605.

Mexico advanced a proposal for the use of silver as a monetary base but the only result was a resolution that the "subject should merit further study by interested nations." Just before the Conference opened, 26 Senators, headed by Elmer Thomas, chairman of the Senate Special Silver Committee, addressed a letter to the President in the following terms:

"We have studied carefully the International Monetary Fund Plan that has been made public by the United States Treasury. Since whatever plan is ultimately adopted will

have to be approved by the Congress, we feel it is our duty to pass on to you without delay certain conclusions we have reached pertaining to this Plan.

"The Experts' Plan suffers from a basic, organic defect in that no place in it is assigned to silver. As a result, there will be an insufficiency of media for the settlement of international balances, and the use of silver as money will be undermined.

"We strongly urge, therefore, that the Plan be revised forthwith so that parities for the currencies of member countries will be fixed in silver, as well as gold. By specifying fixed parities in terms of silver also, the following results would be attained:

"1. The physical supply of standard money would be expanded for the enlarged needs of the postwar world.

"2. The preference of a large part of the population of the world for silver money would be recognized.

"3. The nations of Europe and the Far East now in the throes of wild paper money inflation could return to silver coinage on a sound basis.

"4. The remonetization of gold and silver would thus be effected simultaneously and internationally."

Coal Report

On July 22 the Special Senate Committee headed by Senator Francis Maloney of Connecticut brought forth an "Interim Report on Oil and Coal." This document expresses concern regarding the nation's coal supply for the immediate future, stating that production, although higher than ever before in our history, is continuing to lag behind consumption, with stockpiles constantly decreasing. Regret

is expressed that the Solid Fuels Administration for War has been handicapped in its procedure because of its dependence for major decisions on WPB, WLB, Office of Economic Stabilization, OPA, ODT, the War Shipping Administration and WMC. Under "Factors Limiting Production" are set forth the results of the committee's investigation of manpower, loss of manpower due to strikes, mechanization, effect of price on production, closing of mines and seasonal loss in production. In the section devoted to the effect of price on production, the suggestion is made that Federal control of the bituminous coal industry be resumed.

Steel Wage Case

Early in July the War Labor Board's Panel heard the United Steel Workers' rebuttal in the steel and iron ore wage cases and the panel is now preparing findings of fact for submission to WLB in mid-August. The record is replete with testimony clearly showing that the demands of the union are far beyond the limitations of the Little Steel formula. The United Steel Workers' representatives state that their demand for 17 cents per hour increase is designed to force a change in the Formula.

It is anticipated that it will be several weeks before the Board will announce its decision in the steel-iron ore cases.

Reiterating that it does not have the power to approve wage demands beyond the Little Steel formula for any union WLB has stated that unions may present summaries of evidence (Continued on page 45)



—American Metal Market
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.....STEP UP YOUR PAY ROLL PLAN!

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MINING CONGRESS JOURNAL

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PERSONALS..

F. S. Mulock, vice president and general manager of the U. S. Smelting, Refining and Mining Company, Salt Lake City, was recently elected president of the Salt Lake City Chamber of Commerce, succeeding **Fred H. Knickerbocker**.

A. D. Sproles, formerly assistant general superintendent, Pocahontas Fuel Co., Pocahontas, Va., has recently been promoted to general superintendent to succeed **W. J. German**, who has accepted a Colonel's commission in the United States Army. **Robert L. Boone**, superintendent at Pocahontas No. 7 mine, Jenkinjones, W. Va., succeeds Mr. Sproles as assistant general superintendent.

A. G. Mackenzie, secretary and manager of the Utah Metal Mine Operators Association, was recently appointed as the industrial member of the State Selective Service Appeal Board.

Howard G. Wilcox, dean, School of Mines, University of Alaska, recently completed a series of mining extension courses at Richardson, Naknek, Kodiak, Sitka, Annette Island, Anchorage, Cordova, Juneau, Ketchikan, and Skagway and has returned to College, Alaska.

J. H. Schneider, formerly executive vice president of the Dawson Daylight Coal Co., Dawson Springs, Ky., has been elected president to succeed **Karl Jungbluth**, deceased.

Officers of the Yavapai County Council of the Arizona Small Mine Operators' Association, elected for the new fiscal year, are: **Glenn Francis**, chairman; **John Robinson, Jr.**, first vice chairman; **Harry Hopkins**, second vice chairman; and **Grace M. Sparkes**, secretary.

Paul Sterling, who has been mechanical engineer for the Lehigh Valley Coal Co. for many years, has been promoted to planning engineer. Mr. Sterling has been succeeded by **Edgar Schweitzer**, formerly fuel engineer.

Allan W. Walter has been elected controller of Freeport Sulphur Co., according to an announcement by **R. K. Shirley**, vice president and treasurer of the company. Mr. Wal-



Allan W. Walter

ter was previously associated with the Firestone Tire & Rubber Co. in Akron, Ohio. He is a graduate of the University of Wisconsin and the Harvard Business School.

Mr. Shirley also announced the appointment of **Joseph A. Mullins**, who has been associated with Freeport Sulphur Co. since 1934, as assistant controller.

J. F. Johnson, resident superintendent of the 2C mine of Kelley's Creek Colliery, has recently been appointed to the position of mining engineer for this company.

J. Robert Bazley, stripping contractor and road builder of Pottsville, Pa., recently arrived in England to be a consultant on problems of coal stripping.

Neil A. O'Donnell, who for the past year has served with the Foreign Economic Administration, was recently made general manager of the Idaho Maryland Mines Corporation at Grass Valley, Calif. The appointment is effective July 1. Mr. O'Donnell succeeds **Albert Crase**, who is to continue with the company as consulting engineer.

Paul Morton has been appointed superintendent of the Ames Mining Co., Fayette, W. Va. He was formerly production engineer for the Winifrede Collieries.

F. F. Sampson, manager, New York branch, the Electric Storage Battery Co., Philadelphia, retired on July 1 after 30 years of service. **Daniel P. Orcutt**, who has been assistant manager since 1921, succeeds Mr. Sampson as manager.

H. C. Mowery has been reelected president and director of the Coeur d'Alene Mines Corporation. **H. M. Heumann**, **A. L. Graham**, and **Pete Jacobs** have been elected to the board of directors replacing **Stanley McDougall**, **Dan Leary** and **P. F. Scheble**. A mine manager has not yet been named to succeed **Dan Leary**, recently resigned because of ill health. **L. J. Randall**, secretary-treasurer, has also resigned.

Fritz Nyman has received appointment as general superintendent of the Utah Fuel Co. and the Calumet Fuel Co. Mr. Nyman has been with the Utah Fuel Co. for 17 years, starting as a mechanic and mine engineer. Until recently he has been chief engineer.

The Lorado Coal Mining Co., Columbus, Ohio, recently announced the election of **L. J. Lorms** as president



L. J. Lorms

to succeed **S. B. Johnson** who was made chairman of the board.

Edward S. McGlone, general manager of mining and metallurgical operations for the Anaconda Copper Mining Company at Butte, was recently honored and presented with a medal for "meritorious achievement" by his Alma Mater, the Colorado School of Mines.

Clarence W. Laird, formerly with the New Mexico Consolidated Mining Co., has become mine superintendent for the Glenwood Mining & Milling Co., Inc., Glenwood, N. Mex.

Fraser MacWilliams, formerly assistant general manager in charge of operations for Flood City Brass & Electric Co., has been appointed general manager to succeed **Charles N. Replogle, Sr.**, who died recently.

Dr. J. D. Forrester, for several years on the teaching staff at the University of Idaho, has resigned to become head of the mining department of the Missouri School of Mines and Metallurgy, at Rolla, Mo. He succeeds Dr. S. A. Trengove, who resigned recently to become editor of MINING CONGRESS JOURNAL.

Otto Herres, who has been in charge of the development of the MacIntyre titanium property of the National Lead Company in the Adirondacks and



has managed this property through the construction and organization stages, has now returned to Salt Lake City. He is again associated with E. H. Snyder as vice president of Combined Metals Reduction Company.

Thomas Fraser has recently completed a several months' study of the washability of Brazilian coal, and has returned to Washington. His work there was a joint project involving the United States Foreign Economic Administration and the Brazilian Department of Mineral Production. The investigation is being continued in Brazil under the direction of Alvaro De Paiva Abreu.

G. L. Stapley, formerly engaged in California mining operations near Jackson, Calif., has become mill superintendent for the California Steel Products Company at the Silver Bell-Martinez mine at Superior, Ariz.

L. S. Horne, who has been mine foreman at the Banning No. 1 mine, Pittsburgh Coal Company, has been promoted to superintendent of Banning Nos. 1 and 2.

The board of directors of the Marion Steam Shovel Co., Marion, Ohio, at a special meeting held June 23, 1944, elected a new chairman of the board and a president and general manager to fill the vacancy left by D. J. Shelton, deceased.

J. M. Strelitz was made chairman of the board. Mr. Strelitz has been a director of the company since 1931 and its general counsel for the past 20 years.

C. F. LaMarche was appointed

president and general manager. Mr. LaMarche has served as a director since 1939.

The Arizona Bureau of Mines at the University of Arizona has employed its first woman mineralogist, Miss Blanche E. Lightowler, graduate student of Fishkill, N. Y. She will make mineral tests and rock identifications.

William E. Kress has been appointed sales manager of the Middle West for Philco Corporation, with headquarters in Chicago, it was announced by Thomas A. Kennally, vice president in charge of sales. Kress succeeds John M. Otter, who was named sales manager for the home radio division.

Dr. Gerald F. Loughlin, for the past 9 years chief geologist of the Geological Survey, United States Department of the Interior, has accepted an

appointment to the newly created position of Special Scientist in the Survey, and has been relieved of administrative duties in order to devote himself to research on special problems in the field of economic geology. Dr. Wilmot H. Bradley, for the past 2 years in charge of the Military Geology unit of the Geologic Branch, has been appointed his successor.

C. M. Bales, of Widen, Va., was recently appointed superintendent of mines for the Elk Lick Coal Company in Webster County.

E. G. Dentzer, general manager of the Magma Copper Co., Superior, Ariz., has resigned because of ill health after a quarter of a century service. He will continue as a consulting engineer with the company. His post is to be filled by Wesley P. Goss.

— Obituaries —

William Val DeCamp, 59, identified with Arizona mining from 1915 to 1932, and general manager for the Verde Copper Co. mine at Jerome,



when he left Arizona for California and Bolivia, died June 16 in Monrovia, Calif. In Bolivia he was general manager of the Mauricio Hochschild and Cia, Ltd., tin producer at Oruro.

Karl Jungbluth, 68, president of Dawson Daylight Coal Co., Dawson Springs, Ky., died May 14 in his home in Louisville. He was formerly associated with the Sneed-Meguire Coal Co. and later the Harlan Coal Co.

Rockwell O. Egeland, 60, for the past quarter of a century manager and owner of the Mine & Smelter Equipment Co., Phoenix, Ariz., died on June 23 in his home after an illness of a year. He established his Arizona business after some years spent in Alaska with the Kennecott Copper Co. and other mining concerns.

Charles S. Lincoln, 59, chief design engineer of the crushing and cement and mining divisions of the Allis-Chalmers Mfg. Co., died on May 24.

Mr. Lincoln had been in close contact with the mining and crushing and cement industries for the 39 years he served with the Allis-Chalmers organization. He was a member of the American Society of Mechanical Engineers, the Engineers Society of Milwaukee, and the Wisconsin Society of Professional Engineers.

John H. Roberts, 68, general manager, Grass Creek Fuel Co., and manager, Weber Coal Co., Coalville, Utah, died July 14. Mr. Roberts was a long-time member of Utah Metal Mine Operators Association.

Francis Patrick Gormely, 56, president of Electro Metallurgical Co., Haynes Stellite Co., Michigan Northern Power Co. and several other Units of Union Carbide & Carbon Corporation, died at New Rochelle, N. Y., July 13, after a short illness.

David T. Stuart, 57, mine manager of the Vinegar Hill Coal Co. at Leno, Ill., died recently as a result of injuries received about two years ago in a coal fall.

Daniel C. Green, chairman of the board and chief executive officer of the Cleveland Pneumatic Tool Co., died Sunday, July 2, at the Little Traverse Hospital, Petoskey, Mich., after a seven weeks' illness. His death was attributed to undulant fever. Mr. Green was known nationally as a financier and consultant in the operation of public utility properties and had been made board chairman of Cleveland Pneumatic shortly after the death of L. W. Greve.

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At last, a mine locomotive and shuttle car battery with a revolutionary, new construction that actually gives you 30% longer life . . . and more! A brand new principle of fabricated insulation developed after years of research in the Philco laboratories, and now introduced after exhaustive tests in actual service. It's the *Philco "Thirty"* . . . your post-war battery, available now in certain types and limited quantities. Write today for full information.

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FOR 50 YEARS A LEADER IN MINE STORAGE BATTERY DEVELOPMENT

Placer Scheelite

(Continued from page 37)

which clear water is pumped back into the 50,000-gal. storage tank. About 60 percent of the water is recovered.

The oversize from the trommel drops into a 6-ft. cone from where it is run, when necessary, at 10-15 minute intervals into the picking belt and thence through the dark room which is provided with a 10-in. ultra-violet lamp that hangs over the center of the belt. The high-grade is kept separate from the "half-breeds" which are crushed through rolls and put back into the circuit. The picking belt drops the oversize onto the stacker belt. At present, the tails from the end of this stacker belt are pushed away with a bull-dozer but a 77-ft. steel mast was purchased recently and will be erected at a point 300 ft. from the end of the stacker belt and a double-drum slusher hoist will stack the tails across the arroyo. The same slusher system will keep the first pond from filling up with a slime.

Water for the washing plant is furnished at the rate of 180 gal. per minute from a 650-ft. well, equipped with a Pomona deep-well pump driven by a 75-hp. motor. The power is furnished by the California Electric Power Company at 3,300 volts and is transformed to 440 volts for use in the plant.

The plant is handling more gravel per diem than it was designed for and making a fine recovery. It is built so that its capacity can be doubled by the addition of another table and jig. However, there have been three principal sources of loss:

First. Scheelite too fine to be saved by gravity and carried away in the original slimes. The amount in this case would not pay a profit on the cost to recover it.

Second. Milking of the scheelite concentrate by the rubbing of the particles together while accumulating in the jig or on the table. This is another definite loss that cannot be overcome.

Third. The breaking of small particles from the spuds and half-breeds as they go through the last section of the trommel to the picking belt that are too small to recover by hand. Loss from this source can and will be obviated.

Wheels of Government

(Continued from page 41)

(not more than three pages in length) supporting their claims that the formula is operating to create gross inequities. Industrial employers in these cases may present similar summaries giving their positions. Processing of cases will be continued as usual in

pending wage disputes within the limitation of the wage stabilization order, carrying a proviso however for the reopening of wage features in the event the national wage policy is changed.

Foremen's Unions

The issue over attempted unionization of supervisory employees has been made the subject of another National Labor Relations Board order. Recently a UMW District 50 petition asking for certification for the United Clerical, Technical, and Supervisory Employees Union as the collective bargaining agency for employees of the Rochester & Pittsburgh Coal Company was dismissed. In so acting the Board made the comment that mem-

bers of the union occupying supervisory positions outnumbered members not thus employed and thereby control union policies and practices. The Board further stated that "the Maryland Drydock and Soss cases, taken together, clearly condemn the representation of ordinary employees and supervisory employees by the same labor organization, both because of the inherent threat to the freedom of choice by ordinary employees and because of the irreconcilable and conflicting positions in which such affiliations would place supervisors. The requirement that a labor organization be free of managerial control and fully competent to represent all employees in the proposed bargaining unit is a fundamental one. . . ."

The New Bureau of Mines Organization

A NEW order prescribes the organization of the Washington office of the Bureau of Mines.

The Departmental Office of the Bureau of Mines now consists of the Director, two Assistant Directors, five Branch Chiefs, and one Service Chief.

1. *Director.* Responsible to the Office of the Secretary of the Interior for the formulation of policies and over-all direction of programs of the Bureau of Mines.

2. *Assistant Director G. A. Lamb.* Responsible to the Director for the over-all direction of the Economics and Statistics Branch and the Administration Service to provide for the application of economic principles and policies to the development of the programs of the Bureau and to provide for the application of sound practices of management in the execution of such programs.

3. *Assistant Director R. S. Dean.* Responsible to the Director for the over-all direction of the Mining and Metallurgical Branches to provide for the development of plans and policies relating to mining and metallurgical programs of the Bureau and to coordinate the work of the two branches responsible for these programs.

The Branch Chiefs of the Bureau of Mines, under the direction of the Director and the Assistant Directors, shall have the following functions:

1. *Chief, Economics and Statistics Branch, E. W. Pehrson.* Responsible to Assistant Director, G. A. Lamb, for the conduct of statistical canvassing and economic studies of production, distribution, consumption, stocks, trends, employment, and related factors with reference to all types of minerals.

2. *Chief, Administration Service, W. E. Rice.* Responsible to Assistant Director, G. A. Lamb, for the adminis-

trative management of the Bureau, including budget and fiscal management, personnel management, and the conduct of related administrative services.

3. *Chief, Mining Branch, L. B. Moon.* Responsible to Assistant Director, R. S. Dean, for the conduct of engineering examinations, exploratory projects, and related studies to discover and prove additional deposits of critical and essential minerals and to conserve known mineral deposits through the improvement of operations in existing mines, except fuels and helium.

4. *Chief, Metallurgical Branch, to be appointed.* Responsible to Assistant Director, R. S. Dean, for the conduct of research on the conservation, preparation and utilization of metals and nonmetals involving fundamental and applied research, emphasizing the utilization of critical minerals, and to conduct related ore dressing functions.

5. *Chief, Health and Safety Branch, Daniel Harrington.* Responsible to the Director for the conduct of health, safety and mineral production security inspections of the nation's mines, scientific studies of health conditions in mining, and engineering investigations of safety factors in the mining industry, and to administer the Federal Explosives Act.

6. *Chief, Fuels and Explosives Branch, A. C. Fieldner.* Responsible to the Director for all fundamental, process and pilot plant research and engineering services with reference to coal, petroleum, natural gas, synthetic liquid fuels, mining explosives, and military high explosives, together with the production of helium. Exploration of deposits of fuels shall be conducted under the direction of the Chief of the Fuels and Explosives Branch in cooperation with the Mining Branch.

News and Views

Eastern



States

WEST VIRGINIA

» » » A lively interest in "absenteeism" takes place about the mines of the Island Creek Coal Company at Island Creek, Bond Creek and Marianna. Each week a list of mines is made up and publicized on the basis of having the least absenteeism. At last report, Mine No. 7 headed the Island Creek group, Mine No. 3 headed the Bond Creek group, and Mine No. 1 was first in the Marianna group.

» » » It is reported that all contracts have been let, and work has been started on a new tippie and coal washer on No. 15 and No. 19 mines of the West Virginia Coal & Coke Corporation.

In order to clear the way for the railroad yards, it was necessary to remove 19 dwellings, a school and a church. This work has been completed, and the Uhl Construction Company has started excavating for the tippie foundations. Work has been started by the Mirable Construction Company on the outside mine tracks on the No. 19 side of the hill.

About one year will be required to complete this project and make the new tippie ready for operation. This tippie will be equipped with modern washing and preparation equipment, and will be capable of cleaning and screening approximately 10,000 tons of coal per day.

» » » It is reported that the Western Pocahontas Corporation recently sold 1,392 acres of coal and lumber land on the headwaters of the Big

Cub and Elk creeks in Logan County. Purchase was made by the W. M. Ritter Lumber Company, of Columbus, Ohio. The property is in a single tract and is reported by county officials to contain considerable virgin timber.

PENNSYLVANIA

» » » The State Sanitary Water Board, which has authority to control contamination of streams by the discharge of silt into them, has taken action which will soon force every mine operator to prevent silt from entering the streams.

The Board has directed each person who discharges such drainage into the streams to make a report on or before July 15, 1944, which will show in detail the origin, character and quantities of waste water flowing into the streams.

On or before September 1, 1944, each person discharging drainage into the streams shall submit a general plan showing the steps which he proposes to take for removing the offensive silt from the flow of water, and before November 1, 1944, he must submit detailed plans and the necessary accompanying data, together with application requesting the approval thereof.

After such plans have been approved by the Sanitary Water Board, it will require that the plant called for in the plans shall be promptly constructed in order to effect the removal of the silt from the drainage in accordance with the conditions set

forth in the permit to be issued by the Board.

The permits which the Board will grant will contain a condition that silt and other solids removed from the water shall be stored in such a manner that there is little likelihood of these materials reaching the waters of the Commonwealth as a result of floods or other subsequent action.

» » » Susquehanna Collieries Company recently completed an addition to the Glen Burn Breaker at Shamokin, Pa., to house a 12-foot diameter Wilmut Classifier, with pump, feed, discharge and dewatering mechanism. A steel storage pocket of tank construction was included in order to permit loading railroad cars for shipment to market.

This equipment was installed to prepare No. 5 Buckwheat coal over No. 28 mesh, and is producing an average of 160 tons of low ash marketable coal per day.

» » » Expected to be the largest bituminous coal producer in the world when completed, the new Robena mine of U. S. Steel's H. C. Frick Coke Company, is now delivering coal at the rate of 4,000 tons a day. The new mine located in Greene County, Pa., is described in detail in the current issue of *U. S. Steel News*. When fully developed, it is expected to have a daily output of 20,000 tons of metallurgically washed coal.

The underground development work accounts for most of the present production, and this coal is all being delivered to the Ronco Mine tippie about three miles up the Monongahela, through twin tunnels passing under the river into the Fayette County operations.

The Colvin shaft located 2.6 miles from the river will probably be ready for operation in August. This mine service shaft will serve as a means of entry for the men into the mine, for disposal of slate, and will give

passageway for part of the mine's fresh air supply. Most of the mine's service, repair and maintenance facilities are concentrated at the Colvin shaft site.

At the river, the piers for the Robena docks have already been constructed, but the group of buildings including the tippie, washer and mixer are not expected to be completed for at least a year and a half. By that time, two additional service shafts will have been sunk and put in operation.

» » » It is gratifying to note that the anthracite commercial production during the first quarter of the coal year was two million tons above that produced during a similar period of last year. With a weekly production of 1,140,000 tons, and no interruption in the working time, the industry's production this year should exceed that of last year.

» » » According to statistics supplied by the industry to the Solid Fuels Administration, the average age of anthracite miners is 45 years. Forty-six per cent of them are in the age group between 45 and 64 years. The data came from 53 companies with a tonnage amounting to 82.6 per cent of the entire industry.

» » » At the annual meeting of the Pennsylvania Anthracite Section of the American Institute of Mining and Metallurgical Engineers, held at the Valley Country Club, Hazleton, Pa., on Saturday, July 15, the following officers were elected for the coming year:

Chairman, L. D. Lamont, Pottsville, Pa.; vice chairman, W. C. M. Butler, Hazleton, Pa.; secretary-treasurer, Floyd S. Sanders, Wilkes-Barre, Pa.

Executive Committee for one year—Edward Griffith, Wilkes-Barre, Pa.; Cadwallader Evans, Jr., Scranton, Pa.; H. D. Kynor, Hazleton, Pa.; D. C. Helms, Lansford, Pa.; W. H. Lesser, Scranton, Pa.

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Executive Committee for two years—C. A. Garner, Jeddo, Pa.; Harry Otto, Scranton, Pa.; R. Y. Williams, Pottsville, Pa.; Robt. L. Klotz, Hazleton, Pa.; B. H. Stockett, Pottsville, Pa.

Executive Committee for three years—Evan Evans, Lansford, Pa.; Ralph Lambert, Dunmore, Pa.; Wilmot C. Jones, Jeddo, Pa.; William B. Wells, Pottsville, Pa.; William B. Geise, Nanticoke, Pa.

» » » In the Congressional Appropriations Bill for the Bureau of Mines, there was \$81,000 for anthracite mine research. Under the direction of the bureau, studies will be made of these problems: Increase in man-day production by mechanization, mine drainage, and flood control.

» » » Progress is being made by the Philadelphia and Reading Coal and Iron Company in the rehabilitation of its Pine Knot Colliery, near Pottsville, Pa. At the No. 2 shaft a modern 600-h.p. electric hoist has been installed; and one of the inside projects is a combined haulage and drainage tunnel, 3,690 feet long, between Pine Knot and Oak Hill. At the last-mentioned property is located the breaker in which the Pine Knot coal will be cleaned.

KENTUCKY

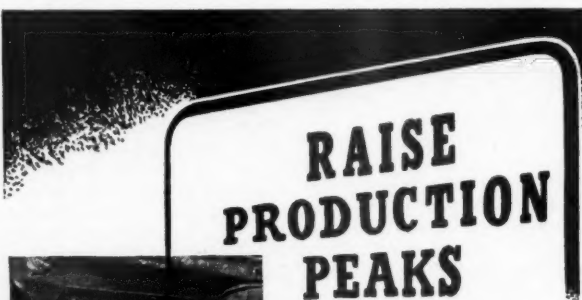
» » » Rescue crews on July 1, brought 18 miners to the surface from a mine of the Ridgeway Darby Coal Company 15 miles east of Harlan, where they had been trapped for nearly 17 hours by fire of undetermined origin.

Mine officials said rescue squads reached the men after driving a new entrance to the shaft from an old air vent through more than 300 feet of dirt and coal, by-passing the fire which previously had hampered rescue efforts.


The discovery of the men alive ended fears of mine officials that they had been trapped by a fall or suffocated by the fumes and smoke from the fire.

Meanwhile, George F. Ward, secretary of the Harlan Coal Operators' Association, said the origin of the fire still was undetermined, although preliminary investigation indicated a heavy fall of coal had shortened an electric trolley wire, starting the fire.

» » » It is reported that the Louisville & Nashville Railroad will soon have ready a ten-mile extension from Cornettsville into Perry County, in Eastern Kentucky, opening 9,500 acres of coal, with 42,000 additional to be





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tapped later. Another 10,000 acres or more will be opened by various small spurs and branches.

The Chesapeake & Ohio Railway has also awarded contracts for constructing about 10 miles of road on the Levisa Fork of the Big Sandy River. The Baltimore and Ohio Railroad expects to construct nearly eight miles of line between Donaldson and Johnson Run, Webster County, West Virginia.

MARYLAND

» » » The 21st annual banquet of the night mining classes in Western Maryland was held at the William James Hotel, Oakland, Garrett County, Saturday evening, May 20. Approximately 100 present and former members of the night mining classes sat down to an excellent dinner. Dr. J. J. Rutledge, chief mine engineer, Maryland Bureau of Mines, acted as toastmaster, introducing prominent members among those who attended the dinner. These included Federal Mine Inspector J. C. Davis, of Mountain Lake Park; the three Walker brothers, Jes, Dan, and Clark; the two Keisters, John and Russell; Coal Operators A. B. Crichton, A. P. Hoffa, Joseph Finzel, and Robert Merrbaugh.

Certificates of attendance were awarded by County Superintendent of Schools for Garrett County Franklin D. Rathbun. He made a spirited address and congratulated the men and instructors on the results obtained. Quite a number of the class members from Allegany County attended the banquet, and all in all it was one of the best banquets that the mining classes have ever held.

Mr. Dan Walker, Jr., supervising mine inspector, U. S. Bureau of Mines, Fairmont, W. Va., gave an interesting address, in which he said in part:

"Coal's place in the industrial scheme is highly emphasized now by the war effort, but let us not lose sight of the fact that it has always been a very important factor and will continue to be one when the war is over. As an employer of people, the coal industry is one of first importance. As an investment, it was reliably estimated to be more than three billion dollars before the war was started, and its annual value is said to be greater than that of all other minerals combined. Also, in addition to heat and the other present-day uses of coal, research is resulting in many new uses of coal, such as a source of gasoline and chemicals. These things are mentioned merely to show that we all are part of a very necessary and stable industry that is becoming more and more important to the general welfare.

"Man's place in the coal industry is vastly improved and becoming more and more opportune. It has been reliably estimated that at present-day wage levels a miner represents an investment of from twenty-five to thirty thousand dollars, and one company, doing mechanized mining some years ago, estimated that

their cost of training a new operator was about three thousand dollars. These figures merely indicate the cost involved, but the scarcity of trained miners today and the difficulties encountered while trying to operate with untrained men, or waiting for the training of new men, is making many in the industry awaken for the first time to the true value of the well-trained miner and the necessity for keeping and broadening training facilities.

"The lack of capable mining officials has always been evidenced in the industry by the high accident frequency rate and the development of 'man-made troubles' in the mines. The selection and training of foremen is today considered a major problem by leaders in the coal industry. Almost every coal-producing company is 'a begging' for one or more capable mine officials.

"The field of opportunity in the coal mining industry is broadening more and

more as research and mechanization continues. The man in our industry today can, if he cares to, find a place for his interest in electricity, mechanics, mining, safety, chemistry, and numerous other fields. Compare this, if you will, with the lot of those in our industry 30 years ago, and see how fortunate we are."

A very interesting talk was also made by Mr. A. B. Crichton, president, the Johnstown Coal & Coke Co., Johnstown, Pa., who commended the work of the Maryland Bureau of Mines, particularly that of the night mining classes, which he said had meant a great deal to the mining companies operating in the state, and especially to the mine employees at Vindex, where his company has been operating for some years.

Invents Coal Sorter

APPROXIMATELY 4,000 tons of stoker coal will be saved annually at Camp Blanding, Fla., as a result of an unusual device invented by Mr. Raymond B. Dennis, a civilian employee at that post, under the sponsorship of a War Department contest which encourages suggestions to save vital war materials.

Mr. Dennis, who is administrative supervisor of the camp coal branch, received a cash award of \$150 under the War Department's suggestion award program for perfecting a screening device whereby stoker and dust are automatically separated from the lump coal, while in the coal-

loading machine, which is all done in one operation.

The system previously employed at the coal yards involved the separation of the stoker and dust from the lump coal by hand or by fork. This not only necessitated the utilization of valuable labor but caused the stoker coal to be wasted by the ton. This hand system also allowed the dust to seep through to the lump coal, and when used in the ranges and furnaces it prevented proper combustion, thus not permitting full heat unit value from a flame. Camp Blanding has been purchasing thousands of tons of stoker coal annually for high-pressure boilers—the same stoker coal which Mr. Dennis' automatic screening device separates and saves for the high-pressure boilers in camp.

Mr. Dennis, a native of Baltimore, Md., has been employed at Camp Blanding for the past four years. He arrived to assist in the construction of the post, and has seen it grow from a trackless swamp-land to the largest Infantry Replacement Training Center in the country.

Mr. Dennis has submitted this device to the War Department, Washington, D. C., for adoption in coal yards of all military establishments. It is expected that general usage of this device will result in enormous savings to the Government.



LINK-BELT

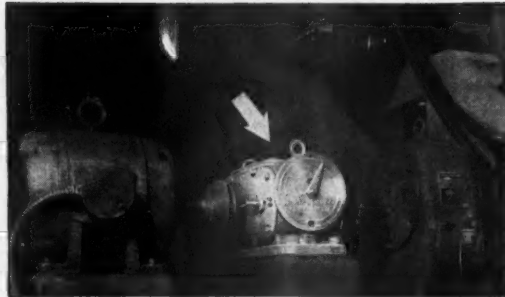


MATERIALS HANDLING AND POWER TRANSMISSION MACHINERY

SERVES THE ENTIRE MINING INDUSTRY



BELT CONVEYORS perform a very important job at this mine in keeping zinc-lead ores "on the move." Link-Belt designs offer the best in belt conveyor equipment.



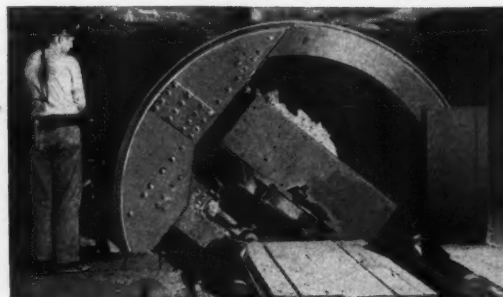
P.I.V. GEAR VARIABLE SPEED CHANGERS accurately control speeds of conveyors, feeders, ball mills, etc.



VIBRATING SCREENS assure high efficiency and low-cost operation on both liquid and dry screening applications.



SORTING-TABLE FEEDER-CONVEYOR handling ore from mine to crusher—one of the many types of Link-Belt Feeders in service in the mining industry.



ROTARY MINE CAR DUMPER on 900-ft. level dumping a 6-ton ore car into bin over primary crusher.



MOTORIZED SPEED REDUCER and ROLLER CHAIN DRIVE operating head shaft of belt conveyor.

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9534-D

As specialists in the design, manufacture and application of materials handling and power transmission machinery for all industry, Link-Belt engineers have learned how to apply an extensive knowledge and experience, effectively, to the solution of all kinds of materials handling and power transmitting problems. Because Link-Belt makes many types of conveyors, chains and power transmitting machinery, we can be of incalculable service in recommending the equipment most certain to aid in attaining efficient production.

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Cleveland 13, Kansas City 6, Mo., Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8, Vancouver.

Central



States

ILLINOIS

» » » A lumber dry kiln is being installed at the Koppers Company, Carbondale, Ill., plant and should be in operation about the middle of July. The Wood Preserving Division has 21 wood preserving plants throughout the country.

The kiln is a Moore reversible cross circulation type, size 22 by 40 feet, and will take a maximum charge of 50,000 board feet. Installation started in May and, when completed, will round out the plant's facilities which include equipment for woodworking and fabricating lumber before treatment, and cylinders for pressure-treating lumber with creosote, Wolman salts, chromated zinc chloride, pentachlorophenol and fire protection chemicals.

» » » Marion W. Cox, 85, the oldest active coal miner in the United States and perhaps in the world, with a record of nearly 74 years of service in the mines near Du Quoin, is still in harness.

Despite his almost three-quarters of a century at hard labor in the mines, Cox is mentally alert and physically fit. He admits being a bit weary after a hard day in the pit, but after donning his work clothes, he's ready to start again.

In his years of mining, Cox has worked in nearly all the mines around Du Quoin and has never suffered so much as a broken bone, although he has been in many gassy mines and tight places.

His father owned and operated coal mines and Cox literally grew up in one, absorbing much mining lore.

Cox could retire from mining comfortably, but as he is an expert in his chosen vocation, he prefers to go with his lamp still lit. The tall, gaunt type built to "take it," he maintains he'd rather "wear out than rust out."

MICHIGAN

» » » The people of Negaunee, aided by their neighbors in other mining communities on the Marquette Range, recently celebrated the 100th anniversary of the discovery of iron ore in this area.

Negaunee began talking of a centennial before Pearl Harbor and had elaborate plans for activities that would take up the entire summer of

1944, but wartime conditions forced streamlining, and festivities were mostly crowded into a Fourth of July program featured by an historical pageant, miners' parade and varied exhibits of the mining industry.

» » » Charles R. Evans, formerly of Scranton, Pa., has been designated as Field Distribution Representative of the new anthracite field office at Detroit, Mich., and will serve in close coordination with the bituminous coal area distribution manager throughout the territory. He will handle problems of hard coal distribution in the territory extending from Ohio to the Dakotas, including all of the east north central and west north central states. Considerable quantities of anthracite are consumed in heating poultry brooders and for domestic heating purposes in this territory. Mr. Evans has been connected with the Hudson Coal Company, the Glen Alden Coal Company, both of Scranton, and with the Delaware, Lackawanna and Western Coal Company, of New York City.

TRI STATE

» » » The Stotts City Mining Company, operating at the Waco Field, is sinking a new shaft on the Bennett lease of the St. Louis Smelting and Refining Company. A new derrick and hopper has been completed over the shaft site. Operations will begin on the 250-foot level as soon as the shaft operations are completed and ore rock will be trucked to the St. Louis No. 9 mill, one mile north. Both companies are on the Kansas side of the Missouri-Kansas state line. Operations are in charge of Kenneth Childress of the Stotts City property; and H. H. Utley of Baxter Springs is district agent for the St. Louis Smelting and Refining Company.

» » » A lower ratio of earnings to labor costs is evident in the recent report of the American Zinc, Lead and Smelting Company when compared with the higher earnings for a corresponding period last year on smaller net sales. The company attributes the reduced ratio to increased labor costs which have risen substantially due to reduced efficiency brought about through absenteeism

and the scarcity of experienced operators. The difference is especially noticeable at the smelting plant.

» » » The St. Louis-Joplin mining tract comprising 160 acres of land in the Chitwood area, northwest of Joplin, a property of the Northside Mining Corporation has been leased on an operating contract to W. S. Rice and associates, according to recent report. The lessees are expected to dewater, develop and mine the old Ethel Gray mill shaft, the old ABC shafts to the north and east of the Northside mill. They will also continue to conduct milling operations there. It is further reported that two eight-inch electrically operated turbine pumps, one a Fairbanks-Morse, the other a Peerless, are now in operation at the two shafts. Dewatering will be carried to the 180 and 200-foot levels where mining operations will be conducted. W. S. Rice is general manager in charge of operations, Jasper Newton Doty is ground foreman, and Ernest G. Kennedy, supervisor of milling operations. George W. Moore of Joplin, president of the Northside Mining Company, has stated that operations will continue under the name of his company.

» » » The Big Tom Mining Company is said to be making preparations to sink a new shaft on the 20-acre Trussell lease in the Thoms Station mining area northwest of Joplin. Seven drill holes put down near the site of the shaft has disclosed good runs of zinc ore. It is reported that the ore runs from a depth of 125 feet down below the 200-foot level. Construction for a derrick has already been started according to reports.

Associated in the Big Tom Mining Company are Thomas D. Winter of Girard, L. C. Aggus of Joplin, W. M. Frogue of Columbus, and W. C. Taylor of Baxter Springs.

OHIO

» » » Henry G. Schmidt, president of the Powhatan Mining Co., Cleveland, said recently in regard to the fire at the company's mine:

"The recent tragic fire . . . is a matter of deepest regret to us.

"The first rule of this company has been to place the safety of its miners above every other consideration, regardless of cost. As a result of rigid adherence to this policy, Powhatan Mine was adjudged the safest coal mine in the State of Ohio in 1943, winning the citation of the Ohio Department of Industrial Relations.

"Our interest in the safety of our miners is illustrated by the fact that we carry on a comprehensive program of education in accident prevention,

and that we pay every employe his full rate for the time he spends at safety meetings. At the meetings, the section foremen discuss with their men all possible means of preventing accidents on their jobs. In addition, the foremen meet with the mine superintendent once a month for from two to four hours to discuss all phases of the safety problem.

"The chief federal mining inspector for Ohio, testifying at the public hearing at St. Clairsville following the disaster, declared that the Powhatan Mine was one of the best equipped coal mines in Ohio, if not in the United States, for fighting fires of this kind.

"This company . . . is making every effort to establish the causes of the disaster and to devise all means humanly possible further to protect the men who mine coal."

» » » The National Coal Association and the Ohio Coal Association have endorsed the new course in technical sales of fuels to be offered this fall by Cleveland College, downtown center of Western Reserve University, Cleveland, Ohio.

Their endorsement was given in the interest of obtaining coal salesmen sufficiently trained to become consultants in the uses of coal both as a fuel and as a raw material for many new industrial products.

This was announced recently by Dean Herbert C. Hunsaker, of Cleveland College, who said the course, which leads to the degree of Bachelor of Science, is designed to give fuel salesmanship the status of a profession. It embraces science, business administration and the art of self-expression.

Prof. H. S. Booth, head of the Division of Science and Mathematics commented that the coal industry "has many big sales problems ahead, although the prospects for coal sales are the brightest in history.

"New combustion methods have increased the importance of coal for heating, lighting and power. New hydrogenation processes have widened the possibilities of converting coal into gasoline, oil and lubricants. Chemistry has created new uses for coal as a source of chemicals, dyes, rubber, plastics, fabrics, drugs and innumerable other products.

"A salesman, in demonstrating the ever-growing possibilities of coal, should have a solid technical background. He must have a good foundation in chemistry and related sciences; he must have a sound business training, and then through courses in writing and speaking, be trained to convey his ideas clearly and effectively."

The student will have a choice of completing the course in four years, of taking an accelerated course or of extending the time required by following the cooperative study plan.

» » » The Lorain Coal and Dock Company, one of the largest producing companies in Ohio, announced recently they would reopen the Stanley mine, one mile west of Blaine, by the first of September. Mr. E. G. Schell, Brookside, is general manager of the company.

The Stanley, formerly one of the largest in Eastern Ohio, has been closed more than seven years. When it was operating on the hand-loading basis it employed from 450 to 500 men. Manager Schell has stated that his company has a large acreage that can

be operated from the Stanley more profitably than from the other mines in that section.

When the mine is opened it will operate with the most modern machinery and equipment. This has been ordered and the company has been assured that it will be delivered soon.

A substantial force of men has already been put to work cleaning up the workings and getting things in shape for installation of the modernizing equipment. More men are to be added to this force just as rapidly as they are available.

SUPPLY YOUR SHOT-FIRERS BAGS TO TAMP WITH

and they will do a better job of bringing down coal. They can seal their shots easier, quicker and better—getting the ultimate in shot control with a greater degree of safety. Mines now using SEALTITE TAMPING BAGS have decreased tamping time and powder costs by increasing tonnage with more effective shooting.

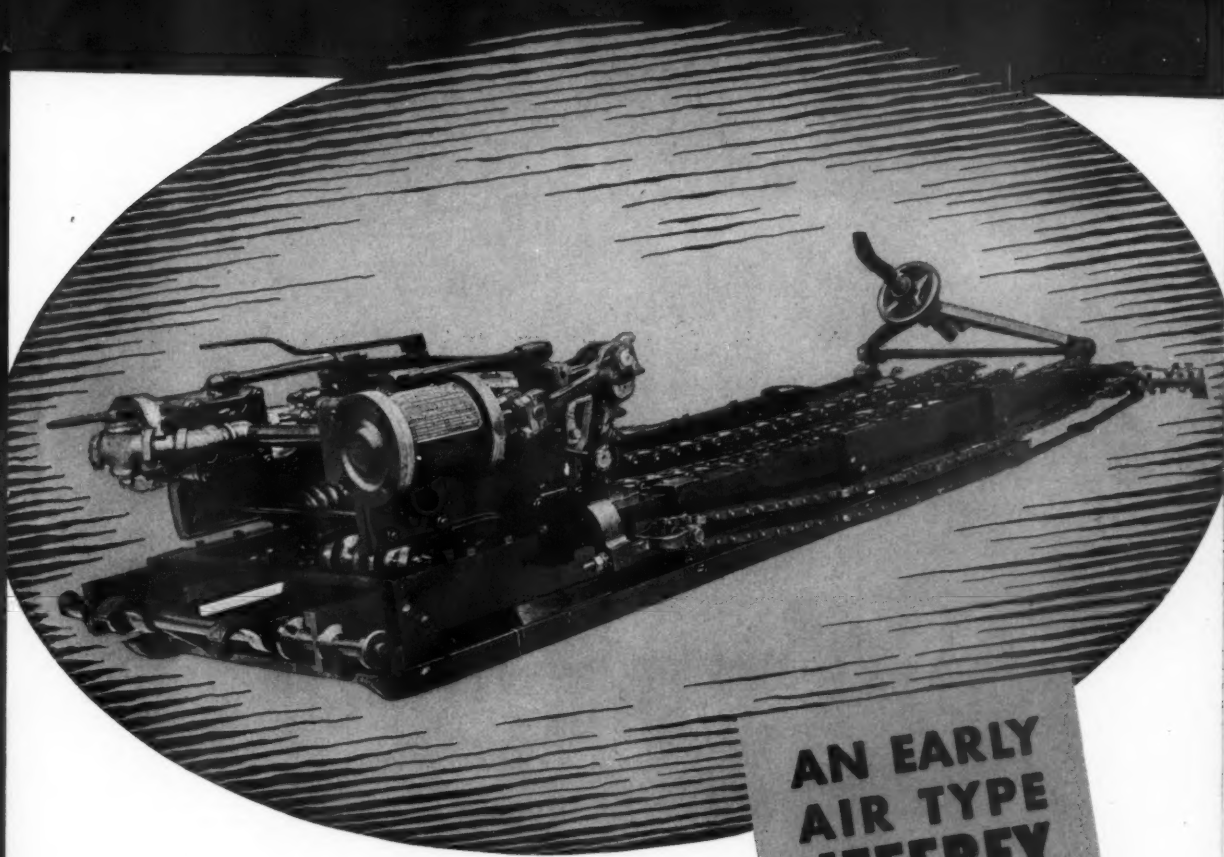
We are prepared to serve more mines with SEALTITE TAMPING BAGS. Leading mine-supply Distributors can give complete service information—or write us direct.

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Mechanical Mine Equipment Since 1880



AN EARLY
AIR TYPE
JEFFREY
CUTTING
MACHINE



JEFFREY PROGRESS

- Progress in mechanical coal cutting is pictured by comparison of these Jeffrey Cutting Machines.

From the early air type Jeffrey cutters to the modern 35-B shortwall cutter illustrated below marks an era of development in the design and development of Jeffrey mine equipment to meet present-day coal mine requirements.

Jeffrey Engineers have kept abreast of the needs of mechanical mining—have met these needs with practical, heavy duty machines. Jeffrey builds coal cutters to meet all conditions—from the low conveyor-type mines to the high seam machine-loaded mines.

Consult a Jeffrey Engineer on your cutting problems.



Jeffrey

**SERVES THE INDUSTRY
BELOW AND ABOVE GROUND
FROM FACE TO RAILROAD CAR**

**CUTTERS
DRILLS
LOADERS
LOCOMOTIVES
FANS
CONVEYORS
BLOWERS
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MINNESOTA

» » » Two new 24-hour loading records at Twin Port docks were established during the month of June. On June 15 the Duluth, Mesabi and Iron Range Railroad docks at Duluth and Two Harbors loaded 406,484 gross tons of iron ore. The previous ore loading record was established on September 14, 1942, with 337,180 gross tons loaded in 24 hours.

On June 19 the Great Northern Railway Company's docks at Allouez loaded 22 vessels with 266,804 tons of iron ore. The record previously stood at 21 vessels with 234,264 tons, established on July 12, 1942.

» » » An underground diamond drilling campaign is being conducted at the Armour No. 1 Mine with a view toward proving up new ore bodies in heretofore unexplored country, and also to investigate extensions of present known ore bodies.

The Armour No. 1 is a veteran producer of iron and magniferous ores, and remains as the only shaft producer on the Cuyuna Range since the shutdown of the Louise Mine early this year.

» » » The stripping program at the Snowshoe Mine is nearly completed, and this new property will enter the shipping list during the month of July. Early production is to be stockpiled, and it is expected that ore will commence to be loaded into cars about July 15.

This new mine, located on the western end of the Cuyuna Range, is being operated by Rhude, Fryberger and Leach.

TEXAS

» » » November 10 and 11 has been designated as International Mining Day by the El Paso Chamber of Commerce.

The Chamber of Commerce, which is sponsoring this event in an attempt to re-establish El Paso as the mining capital of the Southwest, contacted organizations in Colorado, New Mexico, West Texas, Arizona and Mexico before fixing a date so as to avoid conflict.

November 10 and 11 were selected because of the Armistice Day weekend which would give the visitors sufficient time to return to their homes. It was decided on a two-day affair so as to give the American Institute of Mining Engineers an opportunity to hold their meeting in connection with International Mining Day.

The Chamber of Commerce is appointing three subcommittees to handle International Mining Day. The first will draw up a program, and is

now seeking suggestions for the agenda; the second will make the necessary arrangements for the observance of International Mining Day, and the third will make provisions to house the visitors. These visitors are expected to come from the entire Southwest.

Said Chris P. Fox, the Chamber's general manager: "El Paso wants to extend its friendship and hospitality to the mining fraternity. The technical phase of the International Mining Day program will be governed by the wishes of our visitors."

New Conveyor Belt

CONVEYOR operations extending as far as 6½ miles in a single belt, will be possible with Goodyear's new steel cable "compass" conveyor belts was announced by W. C. Winings, manager of the Mechanical Goods Division of the Goodyear Tire and Rubber Company.

"The development of the steel-cable belt for moving coal and other bulk products came as a result of projects that required cotton-cord belt designs where the cords had to be as large as half an inch in diameter," said E. W. Stephens, head of belting sales. "The cables are laid in parallel, side-by-side for the full length of the belt, in a single plane. The cables are brass-plated prior to being covered with rubber, thus obtaining adhesions—rubber-to-steel—much higher than were possible in steel-to-cotton."

"The flex life of the steel cables

assembled in the new belts far exceeds that of cotton-cord, rope or fabric," he explained. "One reason—in addition to the metallurgical advances—is the fact that the ¾-in. OD steel cable is so small that it enjoys a ratio of 1,000 to 1 when flexed over a conventional 48-in. head pulley, whereas good wire rope practice would ask for a ratio of sheave to cable diameter of 80 or 100 to 1.

"With steel cables, not exceeding 5/32 of an inch OD and an overall belt thickness no greater than the conventional 6-ply structure, a strength equivalent to 60 plies of heavy duck is available. This means that it is possible to operate a fully loaded 36-in. wide belt a distance of 6½ miles—13 miles of belting in one piece. With this new cable-belt, 1,000 tons per hour can be handled up a mile-long slope—32 percent slope all the way—on a single 42-in. wide belt."

Using a single belt for a long haul is particularly advantageous in handling sticky or lumpy materials, which might not readily transfer from one belt to another.

Goodyear conveyor belts are used in a wide variety of industries; in mining, and in construction work. Installations of conveyor systems have been particularly notable in coal mining and in the moving of earth fill and other materials to construction sites of large dams requiring huge quantities of materials.

The announcement of the general availability of steel cable belts for conveyors comes after test installations made by Goodyear have been in operation for over two years.

MACWHYTE PREformed

... the CORRECT rope for your
mining equipment

- Internally lubricated
- Made from special steels
- Made by craftsmen with years of experience and PREformed for longer, low-cost service

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Manufacturers of MACWHYTE PREformed and internally lubricated Wire Rope, MONARCH Whyte Strand Wire Rope, MACWHYTE Elevator Wire Ropes, MACWHYTE Braided Wire Rope Slings, MACWHYTE Aircraft Cables and Tie Ropes.
Mill Depots: New York, Pittsburgh, Chicago, St. Louis, Portland, Seattle, San Francisco.
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best grade wire rope... famous for its strength, toughness, and internal lubrication.

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Screw type, 5 and
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Simplex Mine Timber Jacks save many man-hours in cross-timbering by quickly raising beams—wood or steel—and holding them safely in place until Simplex Adjustable Roof Supports or posts are spotted. Three models—screw, ratchet lever, and double acting automatic lowering. Ratchet lever type is also a powerful puller. Ask for new Catalog 44.

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Better, Safer Jacks Since 1899

PARMANCO Horizontal Drills

PARMANCO Horizontal Drills are used exclusively in the Iron Range for horizontal drilling. They are also used by a large percentage of the strip coal mines. The new PARMANCO Vertical Drill has revolutionized test drilling. Write us your drilling problems.



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Western



States

UTAH

» » » Claude P. Heiner, vice president and general manager, Utah Fuel Company, was recently elected president of the Utah Coal Operators' Association, with A. B. Foulger, general manager, Lion Coal Corporation, as vice president. B. P. Manley was elected executive secretary of the association for the twelfth consecutive time.

Nine directors were also elected. They are L. E. Adams, vice president, Spring Canyon Coal Company; A. P. Cederlof, general manager, Peerless Sales Company; A. B. Foulger, general manager, Lion Coal Company; R. H. Harmer, vice president, Hi Heat Coal Company; Claude P. Heiner, vice president and general manager, Utah Fuel Company; Paul Keyser, president, Independent Coal and Coke Company; Terry McGowan, president, McGowan Coal Company; George Schultz, vice president and general manager, Liberty Fuel Company, and P. L. Shields, vice president and general manager, United States Fuel Company.

» » » Development of ore showings carrying values in bismuth, tungsten, lead, zinc, copper, gold and silver at properties of the Alta United Mines Company at Alta, Utah, is announced in the company's annual report.

The showings were opened during a campaign conducted during the past year and a half by the United States Bureau of Mines at the Alta properties. The bureau is continuing its prospecting campaign and plans are being laid to place the property on a producing basis. Prior to the campaign of the bureau, the properties had been idle for several years. Properties under control of Alta United have produced ores valued at approximately \$7,000,000 in the past.

ARIZONA

» » » Arizona's producing mines have been valued at \$158,495,369 for 1944-45 by the state tax commission, an increase of approximately \$4,000,000 over the amount set for the preceding year. The total is to be augmented by \$1,546,700 levied by county assessors against property of the Defense Plant Corporation at Morenci, and \$425,000 at the Castle Dome mine, bringing the probable final total to \$160,467,049, the commission reported.

The Eagle-Picher mine at Ruby was returned to the tax rolls for the year at a valuation of \$155,000, after several years of non-productivity.

» » » Employees of the Inspiration Consolidated Copper Company and International Smelting and Refining Company, in Gila County, have won the Army-Navy "E" production award for the third time, adding a second star to their flag.

» » » Directors of the Shattuck-Denn Mining Corporation, Bisbee, have declared a dividend of 10 cents a share to stockholders on record as of June 20.

» » » Forty-two claims in the Helvetia mining district of Pima County have been reported sold by the Victor Consolidated Mining Company. Purchasers are L. L. Finn, 13 claims; Alta Clemens, 12; S. D. Townsend, 11, and William Wisdom, six.

» » » Mine work of the Tennessee-Schuylkill Corporation will be put on a contract basis, it is reported in Mohave County by N. A. Wimer, corporation president.

Ore shipments are due from the Eureka zinc-lead and silver mine located four miles southeast of Chloride, it is reported by Frank Shuck, the owner and operator. Completion of a new road to the mine will assure the ore movement.

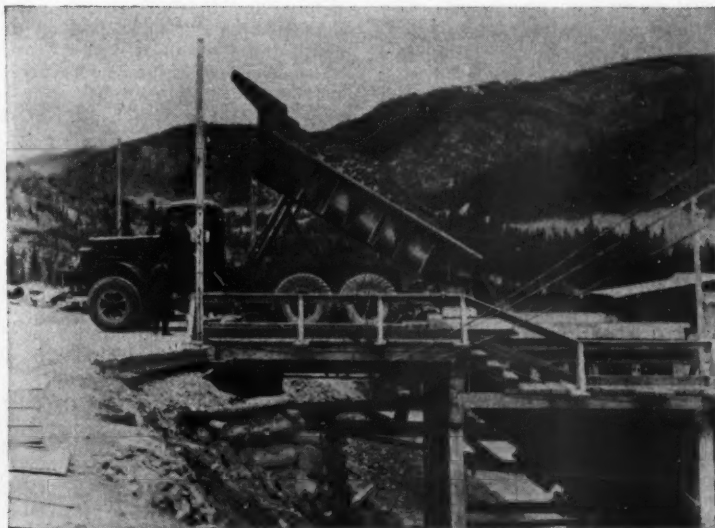
The Tennessee mine in Mohave County is now operating under the system of sand-filling of stopes. Frank Cassidy is in charge of the work, in its experimental stage.

» » » Another Mohave County copper-zinc mine, the Copper World, is ready for production. Owned by the Phelps Dodge Corporation, the mine is under lease by R. L. Dye and J. H. Batrick. The mine first was located in the year 1886 by Gus W. Beecher, Kingman merchant. In 1889 the claims were patented by W. E. Dodge and Willis James, and prior to 1910 shipped high-grade copper ore. Ore was packed out on the backs of burros. A new government access road connects the workings with the Yucca Highway.

» » » A fire of undetermined origin caused damage estimated at \$2,000 recently at the Emerald Isle mine, totally destroying the hoist house, change room and hoist.

NEVADA

» » » Excavation and most of the concrete work has been completed for the new 300-ton crushing plant of the Nevada-Massachusetts tungsten mine near Mill City. It is hoped to start the plant running



In the limestone operations of the Colorado Fuel & Iron Company's Monarch quarry at Monarch, Colo., 30-ton Mack trucks make the transfer from shovel to chute

within a few weeks. It replaces the 250-ton plant which was destroyed by fire last November.

» » » Mrs. J. P. Clough and Frank R. O'Leary have resumed work on the Black Diamond manganese mine, following completion of a two-mile road connecting with the Golconda highway. The property is near the noted Black Diablo mine, from which Golconda Mining Co. has shipped a large amount of rich manganese ore in the past four years. Both properties are situated in Pumpernickel Valley.

Technical and Economic Records

A BILL providing for the conservation of records dealing with the economic and technological phases of the domestic mineral industry was introduced in the Senate recently by Senators James E. Murray of Montana and Carl Hayden of Arizona.

In a joint statement the Senators said:

"A tremendous amount of valuable data has been gathered by various Government agencies and corporations dealing with the production and beneficiation of ores of the various metals and minerals, metallic and non-metallic, during the course of the war program.

"Nearly every foot of known mineral-bearing ground has had scrutiny by some agency. Practically every abandoned shaft has been unwatered and sampled. Many of these were examined during the First World War, and had adequate data been available at the beginning of this emergency substantial sums of money would have been saved and many marginal ore bodies could sooner have been brought into production. After the war many mines again will be abandoned and will become inaccessible.

"The temporary agencies, such as the War Production Board, had to start this war practically from scratch. We do not want this to happen again. It is not too soon to begin thinking of accumulating the valuable information now in the hands of the agencies and Government corporations, which has cost millions of dollars to acquire, into the hands of a permanent bureau. The Bureau of Mines seems to be the proper place for these records and this new bill, which is entitled, 'A bill to insure the preservation of technical and economic records of domestic sources of ores of metals and minerals,' directs the concentration of the valuable portions of these records and files in the possession of the Bureau of Mines when the other agencies no longer have use for them.

"What happened to similar records

The Story of the Nation's Coal Industry

The enterprise and foresight of the men who built it

By EUGENE McAULIFFE

President
Union Pacific Coal Co.

THE growth and development of the coal industry cannot be separated from the growth of nearly every other industry in America. Certainly the speed and efficiency of the modern railroad did not begin to manifest itself until coal replaced the cord wood which was used as fuel for the first locomotives. Manufacturing on an extended scale was virtually non-existent until it was discovered that coal could be used to generate the power with which to turn the wheels of the factories.

Coal is used in many places where it does not manifest itself. Electrically operated trolleys and many main-line and interurban trains use power generated through the use of coal, and electric stoves for heating and cooking are warmed by power that is frequently derived from coal. Indeed, it may be properly said that coal rests at the very foundation of our modern industrial life.

What this means to America in time of war is therefore self-evident. Without coal, our smelters and steel mills could not function; our factories, our war plants could not operate; our transportation would largely be at a standstill, and even our homes and our daily living would be affected.

But when war came to America, the coal industry responded by producing, in 1942, more bituminous and anthracite coal combined than ever before, and in 1943 we reached the all-time high of 649,000,000 net tons. While there is talk of the exhaustion of some of our mineral resources, it

Featured on the "Your America" radio program of the Union Pacific Railroad, July 22, 1944.

accumulated during the last war no one seems to know. We think it is the duty of the Congress to see to it that the millions of dollars worth of mining data now in Government hands be preserved from any possibility of ending up in an incinerator."

NEW MEXICO

» » » The Rocky Mountain Coal Mining Institute has elected G. O. Arnold, Dawson, Colfax County, vice president for New Mexico, and has added J. R. Barber, Raton, Colfax County, and Clarence E. Uland, Gamero, McKinley County, to its executive board.

is worth while to note that there are undeveloped beds of coal in this country sufficient to last us, even at our present rate of consumption, for 3,000 or 4,000 years.

In the Union Pacific territory alone, including the various fields of Colorado, Utah, Wyoming and Washington, there are immense deposits of high-grade coal reserves that will last for many centuries.

We must remember that coal is used not alone in furnaces and boilers. From coal we are manufacturing and can manufacture hundreds of other worth-while products, including drugs, dyes and other chemicals, oil and gasoline, alcohol and plastics. The coal industry looks forward to the opportunity of making vast and vital contributions to the post-war world.

Meanwhile there is a job to do. The trains to carry men and munitions must be kept moving, and the mills and factories must be powered, while the home front must be kept supplied with fuel. We upon whose shoulders the responsibility rests are pledged to do all within our power to fulfill our obligation. But you, as a consumer of coal, may also help.

The Solid Fuels Administration has said that the demand for coal this year may exceed production by 38,000,000 tons. If rationing and resultant hardship are to be avoided next winter, do your part by filling your coal bins now. You will in this way get cleaner and cheaper coal and you will be helping that much more in the war effort.

When victory is won, coal will not decrease in importance to America.

» » » Horace Moses, general manager of Chino Mines Division, Kennecott Copper Corporation, and Joseph F. Woodbury, New Mexico, general counsel for the corporation, were in Washington early in July to attend a labor hearing. They also visited New York City while on the trip to confer with E. T. Stannard, Kennecott Copper Corporation president.

» » » Marston and Berl of Colorado Springs have joined W. J. Knighton in a lease of the Little Goat operation in the Central Mining district. Under the new arrangement, Mr. Edward Thornton is the engineer

for this operation as well as for the operations at Duncan and D. W. Rhinehardt is superintendent of mining for both places. The work on the Little Goat consists of exploratory development and preparations for sinking a new shaft. This is a lead zinc mine with good gold values.

The operation at Duncan is in "the old Mohawk Mine," across the line in Grant County, up Bitter Creek from Duncan. The values are in fluorspar. The small amount of development work done so far gives every indication of a valuable deposit and the work is primarily to develop this deposit.

For the time being, at least, Mr. Marston has discontinued work on the Apache mine at Hachita and has moved the equipment for use at the Mohawk mine.

» » » D. W. Schmitt, general manager of the New Mexico Ore Processing Co., announces his company has leased part of the old Savannah mine properties at Pinos Altos, consisting of 18 claims. The company contemplates early operation of the mines, from which lead and zinc ores are taken with fairly high silver and gold values.

CALIFORNIA

» » » It is reported that Capt. John A. Hassell, veteran Los Angeles mining operator and associates will resume mining at the Gold Ribbon property when wartime conditions permit. The mine is located at Coarsegold near the southern end of the Mother Lode and was producing rich auriferous quartz before stopped by the ban on gold mining. The vein is more than 4 ft. wide, of good mill grade, and a narrow seam on the hanging wall is said to assay better than \$1,000 per ton.

The mill is equipped with amalgamating and concentration units. The mine is developed by long tunnels; old workings are said to contain commercial ore and several thousand tons of mill ore are on the dumps.

Coarsegold was the scene of extensive gold mining 70 years ago, its mines being noted for their output of high grade. The Hassell interests are also said to be planning to build a custom mill in southwestern Nevada to treat ore from controlled mines in nearby districts.

MONTANA

» » » Development and use of titanium is cited to Montana mining men as a possibility in achieving better utilization of the state's resources in the post-war industrial pattern. Dr. R. S. Dean, assistant director of the U. S. Bureau of Mines,



We're employing a skeleton staff until the gold mining ban is lifted

told members of the Last Chance Gulch Mining Association at Helena that the metal is under study by bureau metallurgists and that it apparently will prove valuable as a light metal for use in airplane construction.

Titanium, he added, is the monkey wrench in the machinery which prevents Montana iron ore from being used. Although iron ore is found in abundance throughout the state, the presence of titanium in the ore makes it unsuitable for standard blast furnaces. "To achieve full utilization of Montana's resources, in competition with an international mining industry, the development of such new industries is necessary," Dean said.

"If we are to have a healthy mineral industry, we must consider a post-war pattern which takes advantage of the resources of all regions. We must

make new use of some hitherto unused resources and convince manufacturers of the importance of changing their pattern to utilize these products.

"Whether we agree or not, it seems that this country already is committed to competing internationally in many industries."

He cited Montana chromium as another example of possible development if enough attention is centered on the perfection of a process for production. Although this Montana ore cannot be used in standard ferro-chrome furnaces, it can be effectively utilized by the electrolytic process, he said. Chromium ore was produced in the Columbus area of Southern Montana until the reopening of the Mediterranean resulted in a shutdown last fall.

IDAHO

» » » Sunshine Mining company is driving a new crosscut from the 3,700-foot level in Sunshine workings to open the Chester vein system 1,000 feet below sea level, the deepest mine workings in the Coeur d'Alene district. The crosscut will be approximately 500 feet long and will tap the Chester vein 600 feet below the present deepest development on the 3,100-foot level.

» » » Idaho's big quicksilver mine, second largest in the United States, and called the Hermes, is being closed down because of the drop in the quicksilver market. The Hermes property is in the Yellow Pine district of Idaho and belongs to the Bonanza Mines Company. It produced 4,261 flasks of quicksilver in 1942.

» » » The Lucky Friday Silver-Lead Mine Company at Mullan has opened a shoot of high-grade silver-

lead ore in its east end workings on the 800-foot level. The ore averages 43.4 ounces of silver, 39.6 per cent lead and 3.6 per cent zinc. The company has had ore on this level for practically 250 feet in length, as against much shorter shoots in the upper levels. The first shipment of 1,800 tons of ore from the 800-foot level netted the company over \$15,000.

» » » Governor C. A. Bottolfsen has appointed a committee to direct investigation and development of Idaho mineral deposits under the congressional Boykin Steel Shortage Committee. The committee named by the governor includes Dean A. W. Fahrenwald of the Idaho School of Mines and executive secretary of the State Bureau of Mines and Geology; Otto Frye, Orofino cement producer, and Harry Marsh, secretary of the Idaho Mining Association, who will investigate deposits of fluorite and iron ore in the Salmon River area and at Weiser, Idaho.

Manufacturers Forum

New Circuit Breaker

Following the trend toward oil elimination in indoor switchgear equipment, a new "Ruptair" magnetic type air circuit breaker has been developed by Allis-Chalmers, Milwaukee, Wis., and is now available in high voltage, oil-less switchgear rated 5,000 volts and below and 150,000 kva. interrupting capacity and below. The "Ruptair" breaker has overall dimensions as compact as standard oil breaker switchgear, with all parts readily accessible.

In the new air breaker the arc chute has been carefully coordinated with the contact and arc runner design to give consistent and reliable interruption through the entire range of current to be interrupted. The magnetic circuit, consisting of one husky blowout coil and two laminated iron pole pieces per phase, is arranged

to force the arc up into the arc chute immediately upon separation of the arcing contacts.

Complete inspection and maintenance of the self-contained contact assembly can be accomplished without disturbing the arc chute or magnetic circuit in any way.

New Distribution Agency

Robert Holmes & Bros., Inc., of Danville, Ill., announce that they have been appointed stocking distributors by Manning, Maxwell & Moore for their following lines: Hancock Bronze and Steel Valves, Consolidated Valves, Duragauges, Ashcroft Gauges, American Thermometers, and American Industrial Instruments. Stock will be maintained at the Holmes' plant in Danville, Ill.

Buda "E" Award

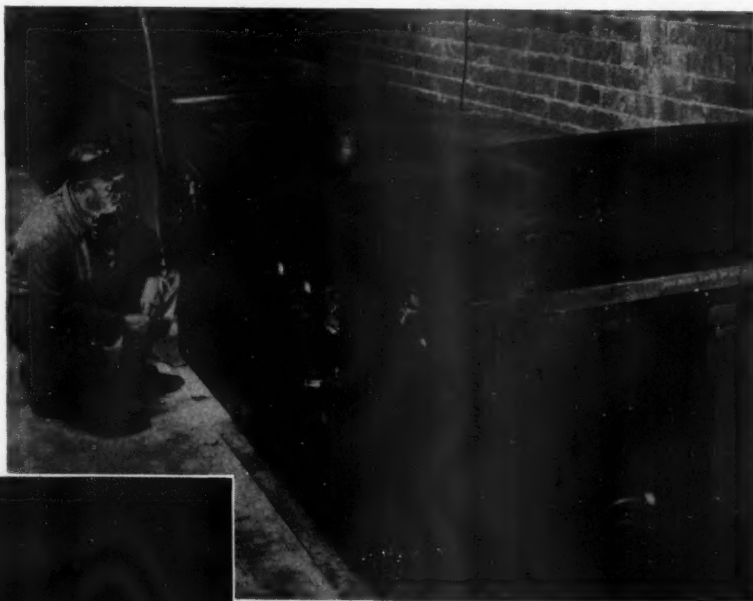
The Buda Company, which has been involved almost 100 percent in the War effort for the last four years in the production of Diesel and gasoline engines, generator sets, fire pumps, lifting jacks and various railroad equipment for the U. S. Army and Navy, was awarded the Army-Navy "E" Flag for excellence in production. The ceremony was held on April 27, 1944. It was attended by over 5,000 people including employees and guests. Colonel Luke W. Finlay, executive to chief of Transportation Corps, Washington, D. C., was the principal speaker; and the "E" Flag was accepted by Mr. J. S. Dempsey, president of the company. Lt. Comdr. Carl C. Stockholm, commanding officer, Shore Patrol, Ninth Naval District, presented the "E" pins to the five representative employees who were elected by impartial ballot.

Portable Ignitron Installed

Portable Ignitron rectifier equipment rated 300 kw. has been installed at No. 3 mine of Reitz Coal Company, Central City, Pa.

Arranged on three cars, the mine-car type wheels facilitate movement into the mine and allow for quick changes in location. Power is supplied by means of a bore-hole cable at 2,300 volts, 60 cycles, three phase a-c. The rectifier converts

Right: M. Belya checks load on d-c end of ignitron



Left: Exterior of substation. Barred opening provides ventilation and allows removal of unit on regular mine rails

the energy to 275 volts d-c for the trolley system.

Latest type Westinghouse developments built into the unit include: 1. Air circuit breaker that eliminates oil hazards. 2. Air-cooled transformer that minimizes fire danger. The portable rectifier makes it possible to maintain better voltage at the working face—production has been increased.



Coal Docks Provide New Use for Dozers

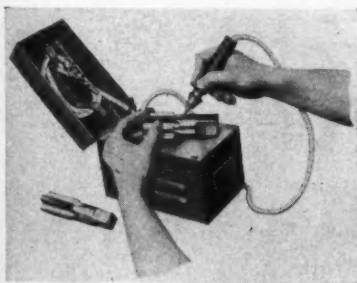
While bulldozers and scrapers have been used effectively for many years in coal mining and stripping operations, it is only recently that wholesale and retail dealers have used them to good purpose at the docks. Shown here is one of the new completely fabricated Heil hydraulic bulldozers mounted on a Model AG Cletrac working at the Northern Coal & Dock Co., St. Paul, Minn.

The unit is used for cleaning up the dock floor, assembling piles for pick-up by clams, and for general utility work.

The new dozer was designed by the Heil Co., Milwaukee, in cooperation with the Cleveland Tractor Co., and is a completely fabricated unit. By prefabricating the mounting members and moldboard parts it was possible to move the blade closer to the tractor and reduce conventional "overhang" weight considerably. Blade action has been speeded up and the lift of the blade has almost doubled. These new developments are now available on all industrial models of Cletrac tractors.

Ideal "Tool Room" Metal Etcher

Anything made of iron, steel or its alloys can be easily and quickly etched with the new "Tool Room"



Metal Etcher announced by the IDEAL Commutator Dresser Company, 1963 Park Avenue, Sycamore, Ill.

It marks numbers, sizes and other important information. The mark is burned right into the surface so that it cannot be worn off through ordinary usage.

Depth of mark is controlled by etching heat and speed of writing. Four etching heats are 120, 240, 420 and 700 watts. Outstanding features include red indicating lamp, protected

four-heat switch, removable hinged cover, terminal tap for "small" two-oz. etching tool and renewable work plate. All parts are enclosed in a compact, attractive case.

In addition to the standard four-oz. etching tool, a small two-oz. tool is also available for marking thin delicate parts. Overall size, 7 1/4 in. x 5 1/2 in. x 8 1/2 in.; weight 16 lbs.

New Outdoor A-C Welders

Two new outdoor alternating-current welders, a 500-amp. type and 300-amp. type, have been announced by the Electric Welding Division of



the General Electric Company. The 500-amp. welder has a current range from 100 to 625 amps., while the range of the 300-amp. welder is from 60 to 375 amps. Both of the new welders are specifically designed for such use as in shipyards or similar outdoor locations where exposure to the weather is common.

These welders are equipped with an "idlematic" control which functions to reduce the output voltage automatically to less than 30 volts whenever the arc is not in operation, yet provides full power for welding directly the arc is struck. In addition, this control is provided with a switch, conveniently operated by a handle projecting through the top of the case, for shutting off the welder when not in use.

Protection against the entrance of rain, snow, and sleet is provided by the drip proof construction of all openings in the top of the sturdy enclosures of the welders, and by a sealed window over the current indicator. The ventilating openings serve both to shed water and to keep air velocity low. A special finish on all internal parts provides protection against corrosion from moist air.

These welders also incorporate all the desirable features of General Electric indoor a-c welders of this type, including built-in power-factor improvement, fingertip adjustment, stepless current control, and fan-forced ventilation.

CATALOGS AND BULLETINS


ELECTRICAL DIAGRAM SYMBOLS. *The I-T-E Circuit Breaker Company*, 19th and Hamilton Streets, Philadelphia 3, Pa., offers bulletin 4403 which illustrates the new American standards for graphical symbols for power control and measurement as published by the A.I.E.E.

ALL-PLASTIC GOGGLES. *Mine Safety Appliances Company*, Braddock, Thomas and Mead Streets, Pittsburgh. Bulletin CE-25 describes the new all-plastic goggles, "Looks." The new goggles feature light weight, wide vision and comfort, and are suitable for both men and women.

MINE CAR DUMPING AND CONTROL DEVICES. *The Mining Safety Device Company*, Bowerston, Ohio, offers a 24-page booklet which illustrates and describes the Nolan line of cage, car, and other dumping and control devices.

MINING EQUIPMENT. *Robert Holmes & Bros., Inc.*, Danville, Ill., offers a 4-page bulletin covering hoisting, haulage, and auxiliary mining equipment which was custom built to suit particular requirements.

PORTABLE CAR UNLOADING EQUIPMENT. *The Jeffrey Manufacturing Company*, Columbus 16, Ohio, offers bulletins No. 779 and No. 781 describing a portable car unloader which handles coal at the rate of 75 tons per hour and an accompanying portable scraper conveyor to handle the coal from the unloader.



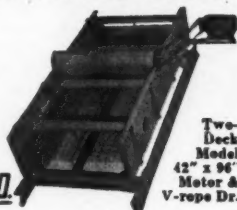
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